DOCUMENT RESUME

ED 113 663 CG 010 167

AUTHOR	Moriarty, Joseph B.; And Others
TITLE	Resource for Evaluating VR [Vocational Rehabilitation] Programs.
INSTITUTION	West Virginia Univ., Morgantown. Regional Rehabilitation Research and Training Center.
SPONS AGENCY	Social and Rehabilitation Service (DHEW), Washington, D.C.
PUB DATE	[74]
NOTE	144p.; Not available in hard copy due to marginal legibility of original document
EDRS PRICE	MF-$0.76 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	*Evaluation Criteria; Measurement Techniques; Mentally Handicapped; Norm Referenced Tests; Physically Handicapped; Program Descriptions; *Program Evaluation; *Rehabilitation Counseling; *Self Evaluation; *Vocational Rehabilitation
IDENTIFIERS	PAT; *Profile Analysis Technique

ABSTRACT

Operating under the assumption that: (1) state agencies routinely collect large amounts of data; (2) these data possess significant potential for evaluating VR programs; and (3) the program evaluation potential of these data has been largely untapped, the W. Va. Research and Training Center has been developing techniques for evaluating rehabilitation programs. This publication contains three papers, the first of which details the basic rationale for a technique developed in the Research and Training Center that is designed to simplify the ultimate development of standards for self-evaluation of VR programs. This technique, called Profile Analysis Technique, takes currently existing data and formats it in such a way as to increase its intelligibility. The second paper, dealing with Marco and Micro Aspects of Program Evaluation in rehabilitation, takes the theoretical approach developed in the previous paper and shows its application to a number of real-life situations. The third paper, dealing with Measurement of Client Outcomes, continues with a demonstration of how routinely available data can generate fine-grain analysis of program functioning. (Author)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED113663

RESOURCE FOR EVALUATING VR PROGRAMS

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

CG 010 167

BEST COPY AVAILABLE

RESEARCH AND TRAINING CENTER

INSTITUTE, WEST VIRGINIA

PREFACE

Responding to both internal and external pressures, rehabilitation has developed a great deal of interest in program evaluation.

Consistent with this prevailing climate, the West Virginia Research and Training Center in Vocational Rehabilitation has been devoting an increasing amount of time and energy to the development of techniques for evaluating rehabilitation programs. From the outset we in the West Virginia Center have been struck with three facts.

Fact 1: State Agencies routinely collect gobs of data (R-300 etc.).

Fact 2: These data possess significant potential for evaluating VR programs.

Fact 3: With some singular exceptions the program evaluation potential of these data has been largely untapped.

Struck by these three facts we in the West Virginia Center became convinced that before all kinds of new program evaluation strategies be developed, that the first task at hand was to take a look at the value and potential of what was already under our noses.

Part of what we found under our noses is contained in this publication. This publication represents a collection of three papers. The first paper details the basic rationale for a technique we have developed in the Research and Training Center that is designed to simplify the ultimate development of standards for self-evaluation of VR programs. This technique called Profile Analysis Technique takes currently existing data and formats it in such a way as to increase its intelligibility.

The second paper deals with Macro and Micro Aspects of Program Evaluation in rehabilitation. This paper takes the theoretical approach developed in the previous paper and shows its application to a number of real life situations within Region III.

The third paper dealing with Measurement of Client Outcomes continues with a demonstration of how routinely available data can generate fine-grain analyses of program functioning. Again, it is to be emphasized that all of the material presented in this publication comes from already existing data.

On this score we have heard the argument that evaluation findings based on routinely collected information is somehow automatically suspect. Time and again we have heard knowledgeable people within rehabilitation talk about either the inadequacies of current forms or the lack of enthusiasm for accuracy among those who fill these forms out.

We respectfully submit that to dismiss out of hand routinely available data is at best premature. The fact that certain items on forms like the R-300 are error-prone is conceded. However, we believe it is an unwarranted inferential leap to go from such a concession to the broad dismissal of currently available data as providing at least a beginning for objective program evaluation.

In short, to use the slang of the day, until you try it—don't knock it. Or, try it, you'll like it.

And who knows. Maybe when those who are saddled with the responsibility for "all that paper work" begin to see greater use being made of the paper, perhaps we will experience a corresponding decrease (at least in part) in resistance to doing this very paper work.

Joseph B. Moriarty, Ph. D.
Director
West Virginia Research and Training Center

PROFILE ANALYSIS TECHNIQUE (PAT): Developing Standards for Self-Evaluation of VR Programs

OR

A Possible Answer to the Age Old Question: "But What The (expletive deleted) Does All This Stuff Mean?"

by

Joseph B. Moriarty, Ph.D.
Associate Professor, West Virginia University
Director, West Virginia Research and Training Center

The following is a true story. The names have been changed just to be ornery. The cast of characters include a Chief of Casework Services in a State Rehabilitation Agency, his assistant, and a data processing person.

Beginning of Episode

Chief: I tell you we have a problem with case flow. Clients are just spending too much time in certain statuses.

Assistant Chief: I've got an idea. Why not have Fred over in the Data Processing give us a print-out on how long clients are spending in the various statuses.

Chief: Yeah. While he's at it, why don't we have Fred also give us a breakdown by districts within the state. And also by disability groups.

Assistant Chief: Right. That way we would have a good look at case flow. A good detailed look.

A week goes by. Fred works diligently. He produces a computer print-out one inch thick. It contains all the information asked for and more. Fred, with thinly disguised feelings of pride at the wonders and alacrity of modern technology, drops the print-out on the Chief of Casework Services' desk.

Fred: Well, here it is. I've given you a breakdown by disability and by district. I've also given you a breakdown by disability within each district.

Chief: That's exactly what we need. Thanks a bushel.

Moments later the Chief of Casework Services excitedly calls his assistant, giving him the good news that the information they wanted has arrived.

The assistant immediately huddles with his boss. As they begin to pour over the computer's largess, their interest and enthusiasm begin to wane.

Chief: Look here at these disability codes. People with these disabilities are spending 2.08 months on the average in Status 10.

Assistant Chief: Yeah. They are. But clients with the same codes are spending 3.17 months in Status 24.

Chief: (Leafing through the rest of the print-out) Well. . . .there it is. But what the (expletive deleted) does all this stuff mean?

End of Episode

Not Just Data. Reality.

In their data processing advertisements IBM, with pardonable immodesty, boast that they give their consumer the Holy Grail of *reality*. Not just data.

I'm Joe Moriarty. I'm the Director of the West Virginia Research and Training Center in Vocational Rehabilitation. In the Center we have struggled with the issues of data and reality for some time now. It's our belief that the Chief of Casework Services in that little episode started out with a reality question. He got back just data.

At the West Virginia Research and Training Center it's our belief that one of the major issues confronting state agencies—in this era of evaluation—is how to translate data into reality. Or a view of reality. A view of the reality of program functioning demands the presence of data. But the presence of data, even in abundant quantities, does not guarantee a view of program reality. Put another way: the presence of data is a necessary, but not sufficient condition, for viewing and evaluating a VR program.

Dataphobes vs. Dataphiles

The issue of translating data into reality becomes especially critical in the field of rehabilitation. Research in the area of vocational interest suggests that those who go into helping professions like rehabilitation tend to be people-oriented. Not data-oriented. Or thing-oriented. I'll go one step further. I'll suggest the hypothesis that being people-oriented is negatively associated with being data-oriented. If this is true, many people in rehabilitation are (pardon the word coinage) *dataphobes*. *Dataphobes* are, as the term implies, folks whose response to data is a phobic one.

The world is peopled with *dataphobes* on the one hand and *dataphiles* on the other hand. You see, Fred in our little episode is probably a *dataphile*. *Dataphiles* are people who derive sensual pleasure from manipulating data. *Dataphiles* are inclined to view the massage of data as terminal rather than instrumental behavior. *Dataphobes*, by contrast, need to be nudged into accepting the possibility of data manipulation as having some instrumental value.

What's Needed

As rehabilitation moves into more formalized program evaluation techniques, the West Virginia Research and Training Center thinks that the establishment of standards is one of the very first things that need to be done. But the question comes up, "Where do you go for standards?" In our judgment one of the answers to that question is: To state agency program data.

Take our Chief of Casework Services and his assistant in our little episode. He was stymied. Why? Because he had no standards for evaluating whether or not time periods such as 2.08 months is long, short, or about average.

What we are therefore talking about in more technical jargon is *norm-referenced standards*. It should be emphasized that *norm referenced standards* allow one to make statements regarding how usual or unusual a particular piece of program information is.

In the opinion of the West Virginia Research and Training Center, the standards that get developed should have the following characteristics:

1. Ease of interpretation.
2. Orientation toward rehabilitation.
3. Flexibility.
4. Simplicity in computation.
5. Permitting multiple criteria analysis.

PAT: Essential Idea

The essential idea behind PAT (Profile Analysis Technique) is to meet the above-mentioned five criteria. What we have done is take information routinely collected by state agencies, on forms like the R-300. We have then formatted this information in such a way that a state agency can readily compare its performance with Regional standards or national standards. This technique also permits the comparison of smaller operational units (e.g., districts) within a state against a state standard. Finally, the approach allows for development of standards for analyzing individual counselor performance.

An Example

To get a feel for how PAT works, look at the illustration on the following page. It details a profile of a state agency (simulated data) on several significant factors. As you look at the profile, you'll see that the rows have numbers ranging from 1 to 9 and the columns are alphabetic designations referring to specific aspects of program function, e.g., number of rehabilitants, number per one hundred thousand population, etc.

As you look at the left-hand side of the chart, take note of the shaded area that is in the middle of the chart surrounding the number 5. In PAT, 5 represents the exact average. As you go up higher you move above average. As you move below 5 you of course move below average. For purposes of general discussion we suggest the following interpretation:

Profile scores of 9, exceptionally high,
Profile scores of 7 and 8 are high,
Profile scores from 6 to 4 are in the average range,
Profile scores of 3 and 2 are low,
Profile scores of 1 are exceptionally low,

With this background one would interpret the profiles presented on page 5 as indicating an agency whose raw closure production was right at the average based on national standards. However, their production of rehabilitants on a population and counselor basis was low. In contrast the cost per rehabilitant was high.

If you were a state agency director, and you were to stop the profile analysis at this point, you might have some concern as to what was happening in your program. Why? Well, because below average production is present despite high cost per rehabilitant.

But going on, the profile reveals other very significant evaluation factors. For example, on factor E (percent of caseload severely disabled) this particular agency is exceptionally high. Consistent with that, the agency is also high in average case difficulty. Also, the clients of this agency are high in the amount of time it takes them to get rehabilitated (Factor G). But once rehabilitated, the clients of this agency have earnings that are high for rehabilitated clients (Factor H).

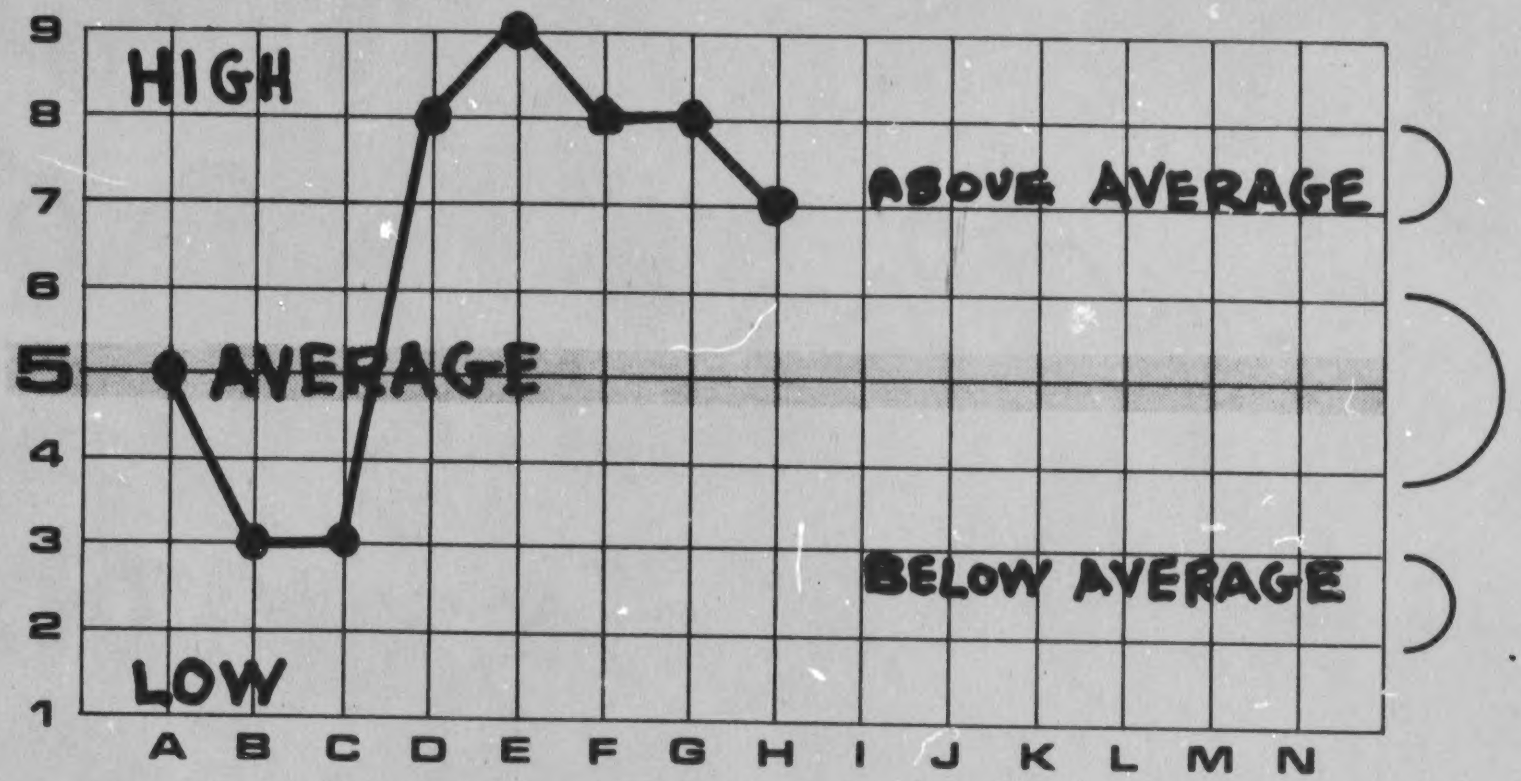
Putting all this together, the picture that emerges is that of an agency whose quantative production is low but whose cost is high. But this high cost-low production seems to be caused by: first of all taking clients who are more severely disabled to start out with; working in greater depth with those accepted with results showing up in the earnings picture at closure.

A Contrasting Example

If you look on page 6 you'll see a second example of PAT applied. This contrasting example also represents simulated data for a second state agency. This second agency is like the first in that it is right at average as far as raw number of rehabilitants is concerned (Factor A). But the similarity in the two profiles ends there. For one thing, this second agency really does an exceptional job from the standpoint of number per hundred thousand population (Factor B). They are also a high as far as production per counselor is concerned. Another contrast aspect to this profile is the low cost (Factor D) per rehabilitant.

But PAT shows this second agency to be well low as far as the percent of their caseload being severely disabled (Factor E). Consistent with this is their low showing as far as average case difficulty is concerned. And while they move clients quickly to closure (indicated by a score of 3 under Factor G) the average earnings of clients once rehabilitated are exceptionally low for rehabilitated clients.

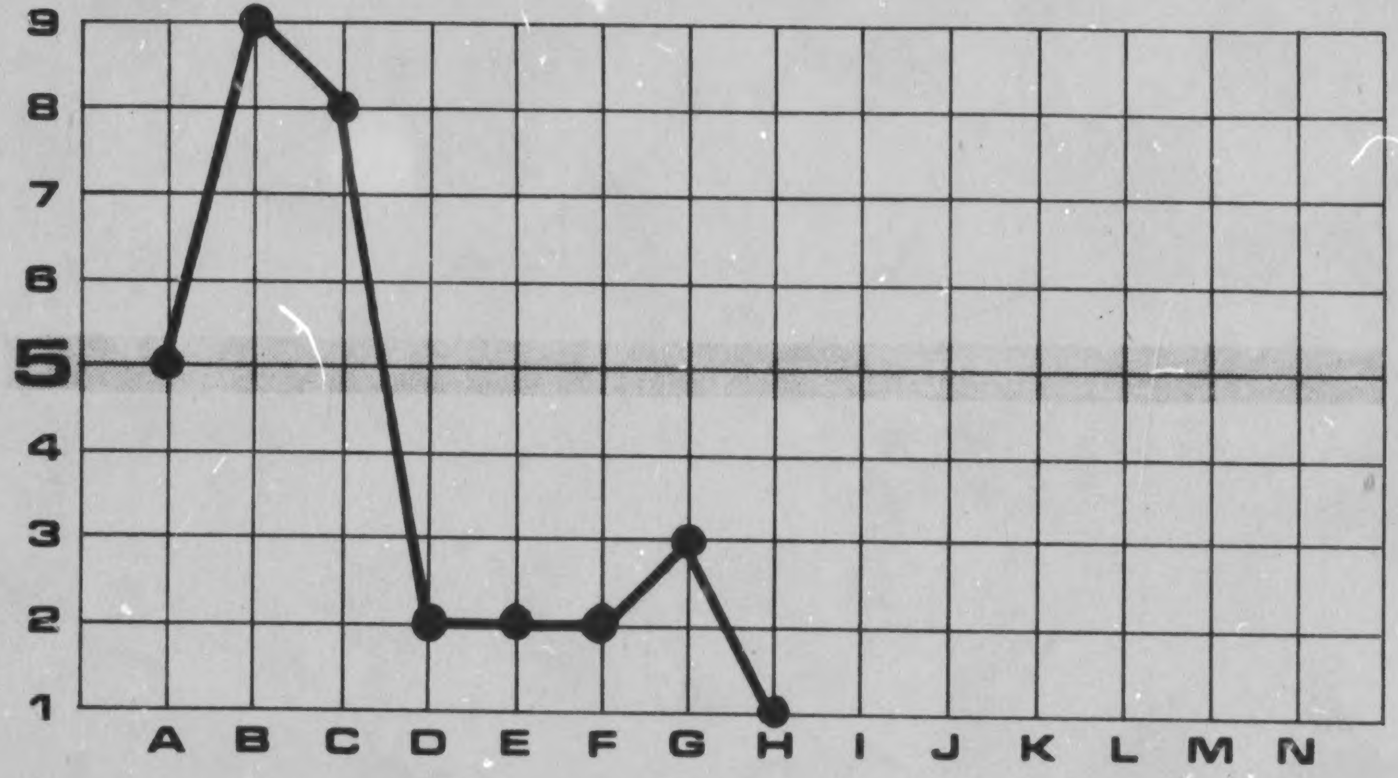
So the contrasting picture of this agency is that of one whose good showing in production and cost areas may be due to accepting less severely disabled clients, doing less for them and bringing about less improvement in earnings picture.



A. . .NUMBER OF REHABILITANTS
B. . .NUMBER PER 100,000 POPULATION
C. . .NUMBER PER COUNSELOR
D. . .COST PER REHABILITANT

E. . .% SEVERELY DISABLED
F. . .AVERAGE CASE DIFFICULTY
G. . .AVERAGE TIME TO CLOSURE
H. . .AVERAGE EARNINGS AT CLOSURE

PAI



A. . .NUMBER OF REHABILITANTS
B. . .NUMBER PER 100,000 POPULATION
C. . .NUMBER PER COUNSELOR
D. . .COST PER REHABILITANT

E. . .% SEVERELY DISABLED
F. . .AVERAGE CASE DIFFICULTY
G. . .AVERAGE TIME TO CLOSURE
H. . .AVERAGE EARNINGS AT CLOSURE

Ease of Interpretation

As I said earlier, one of the qualities we felt should go into the development of standards is ease of interpretation. We think that PAT fulfills this requirement. One nice feature of using PAT is that not only is interpretation made easier, but communication is made easier as well. For example, take the two contrasting state agency profiles we just looked at. The contrast was made possible because the performance of the two agencies was referred back to a common standard ranging from 1 to 9. If PAT were adopted (regardless of what the context is) a number 5 always refers to the average. A number 9 always refers to the highest possible score and a number 1 always refers to the lowest possible score on a given factor. So we think ease of interpretation and communication are achieved with PAT. Also, on the business of interpretation, it should be pointed out that contrast can be made easier by transferring information from paper to transparencies. A number of offices have machines that do this in a matter of seconds. By superimposing one transparency on another contrasting to profiles becomes quite convenient.

Rehabilitation Oriented

A second characteristic we stated earlicr was rehabilitation orientation. The West Virginia Research and Training Center feels that standards developed for rehabilitation should be clearly rehabilitation oriented. What does this mean? Well, in recent years what with the increased attention to program evaluation, a number of evaluation models have been developed based on various frameworks, e.g., economic industrial. While these models are stimulating and potentially fruitful for rehabilitation we must not lose sight of the fact that rehabilitation in and of itself has its own structure and process. Everything else being equal, standards should relate back to these structures and processes. Even at the semantics level some heuristic advantage may accrue from viewing of rehabilitation as an input, output system. These terms borrowed (I presume) from computer technology, have value in that they may stimulate ideas based on an analagous relationship to a computer.

But rehabilitation is after all not a computer. We must not lose sight of the fact that the rehabilitation program, while having some aspects similar to an input, output system. is something radically different. In similar fashion, people in profit-making enterprises may justifiably object if rehabilitation standards were applied to their operation. Similarly uncritical acceptance of models and standards gleaned from profit-making enterprises is likewise unwarranted.

As one reviews the structure of PAT, it should be clear that this is a rehabilitation oriented approach. The eight factors (A through H) we have identified are intended to be suggestive. But they are factors that usually consume a great deal of concern both within agencies as well as within constituencies to which agencies are responsible, e.g., Congress, state legislators, etc. While on this point, it should be emphasized that the factors on the chart are labeled only up to H. Blanks are left for description of Factors I through N. What we are trying to communicate here is that other factors needing standardization are quite easily added to the PAT profile. Also there is nothing sacrosanct about Factors A through H. They can be amended, changed or altered in any way deemed desirable.

Flexibility

This brings us to the third characteristic of the PAT system: flexibility. Earlier in our discussion we had alluded to the fact that the PAT approach can be based on established national standards. The two illustrations found on pages 5 and 6 we contrasted two state agencies against common national norms. We could, however, have just as easily contrasted the same agencies simultaneously against Regional norms.

The norms for a region could be presented as a graph line superimposed on the chart for either of the agencies presented in the examples 1 and 2.

Moving one step further, it would be possible to contrast for example, counselor performance against state as well as national or regional norms.

With an appropriate data base, for example, a single counselor might score 9 in production within his own state agency. That same counselor productivity may be the equivalent of the 7 on a regional basis and an 8 on a national basis.

The above is intended to give a flavor as to the flexibility with which the PAT approach can be utilized.

Simplicity in Computation

A desirable characteristic to have in standards is that of computational simplicity. The PAT system by limiting standards to integers ranging from 1 to 9 goes a long way toward this computational simplicity.

Some statistical procedures (e.g., correlations) require taking existing data and squaring and summing the numbers after squaring has been done.

In the PAT approach the highest number is 9. This makes it a lot easier to square than numbers whose values may be two or three digits or more with decimal points to boot. This computational simplicity is particularly important where access to a computer is not available. But should a computer be available the PAT limit of 9 makes it more convenient to record and store information on computer cards and related devices.

Multiple Criteria Analysis

This aspect of PAT is one of its most important. As rehabilitation strives to develop greater specificity in its program evaluation efforts, we must move away from single factor thinking. By that I mean we must recognize that a rehabilitation program is a many-sided thing. It is inappropriate to ask: Is this program good? So most issues regarding the worthwhileness of a program need to be pushed one step further. The question needs to be further asked: Good according to what criterion? Good according to what standards?

PAT, by bringing together multiple standards allows the agency evaluating itself to look at more than one dimension simultaneously. Such an approach depicting the dynamic interplay of multiple factors permits a view of reality that is closer to what is.

Conclusion

The PAT is not going to solve all of life's ills. Unlike IBM the West Virginia Research and Training Center is loathe to claim that PAT will insure a view of reality. However, we are in a position to state the adoption of a procedure like PAT can do much toward accelerating the healthy trend toward self-analysis and self-scrutiny.

Macro-and Micro-Aspects of Program Evaluation in Rehabilitation

Richard T. Walls, John D. Stuart, and M.S. Tseng

West Virginia Rehabilitation
Research and Training Center (RT-15)

Macro-Aspects of Program Evaluation

Program evaluation may be thought of as a number of relationships and interrelationships. Some of these may simply reveal relative positions of a state or program with regard to some external standard such as a national mean. Other relations may probe more complex interrelations among variables. The first part of this paper is devoted to examining a means for representing simple relations to a national, state, or program average. We have termed this macro-aspects in program evaluation. The second part of the study addresses in depth such relations within a single program. We have termed this micro-aspects in program evaluation.

The stanine is a convenient means of representing the relative standing of a given agency or program for a particular variable. The stanine scale is simply a scale ranging from 1 to 9 with an average of 5 and a standard deviation of 2.* A profile of a state or agency may be easily interpreted from such a chart. We have illustrated this by plotting several variables taken from the 1971 or 1973 national statistics for Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. The variables are listed on the stanine charts on the following pages.

There are five general categories for each state:

(1) Population
(2) Case Load
(3) Cost
(4) Caseflow and Management
(5) Client Outcomes

*Stanine $= 5 + 2\left(\frac{x-\bar{x}}{sd}\right) = 5 + 2\,(z)$

Each of the five general categories contains several subvariables represented by letter on the chart. A through F under Population are for 1973; the remainder that are charted are for 1971. A number of important variables are listed, but are not available from currently published national data.

Several examples should facilitate the reader's interpretation of these charts.

Example 1. -- Number in Caseload Per Counselor (I first chart).

Delaware was considerably below the national average (Stanine 2).
District of Columbia was close to national average (Stanine 5).
Maryland was above average (Stanine 6).
Pennsylvania was also above average (Stanine 6).
Virginia was slightly above average (between Stanine 5 and 6).
West Virginia was about average (Stanine 5).

Example 2. -- Number of Rehabilitants Per 100,000 Disabled (E first chart).

Delaware was very high (Stanine 9).
District of Columbia was very high (Stanine 9).
Maryland was above average (Stanine 6).
Pennsylvania was average (Stanine 5).
Virginia was above average (Between Stanine 7 and 8).
West Virginia was very high (Stanine 9).

Example 3. -- Cost-Diagnostic & Evaluation (B second chart).

Delaware was below average (between Stanine 2 and 3).
District of Columbia was below average (between Stanine 3 and 4).

Maryland was below average (between Stanine 3 and 4).

Pennsylvania was average (Stanine 5).

Virginia was below average (between Stanine 3 and 4).

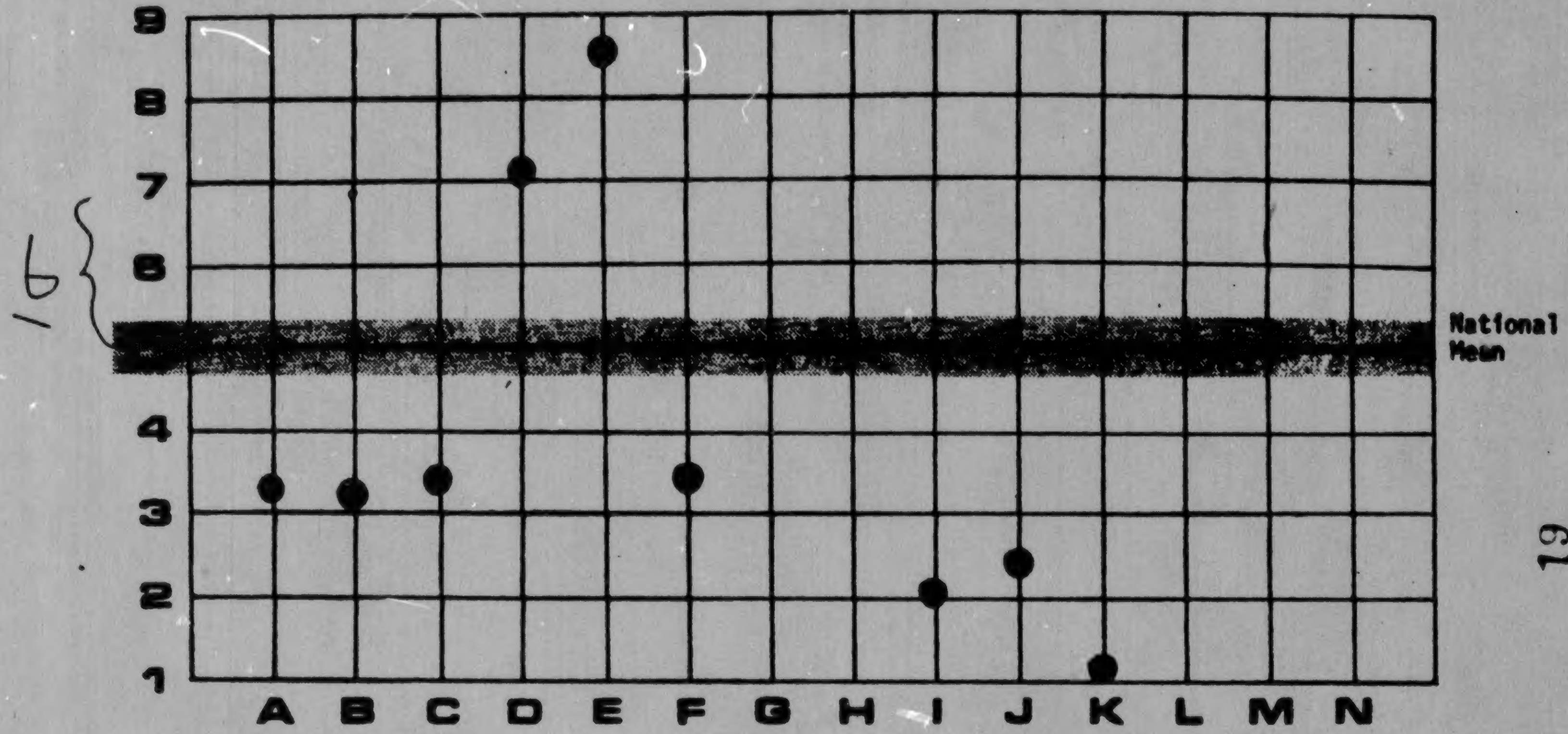
West Virginia was above average (Stanine 8).

Example 4. -- Cost Per Rehabilitant (A second chart).

All states in Region III were below the national average in Cost Per Rehabilitant. These costs ranged from Stanine 2 for Maryland to Stanine 4 for Delaware.

This macro view has been presented for several states compared to national norms. The same stanine charts may be used to compare districts with state norms or counselor with district norms etc. That is, even such a simple macro approach may yield comparatively fine grained and useful information for program improvement.

11 # 7.3

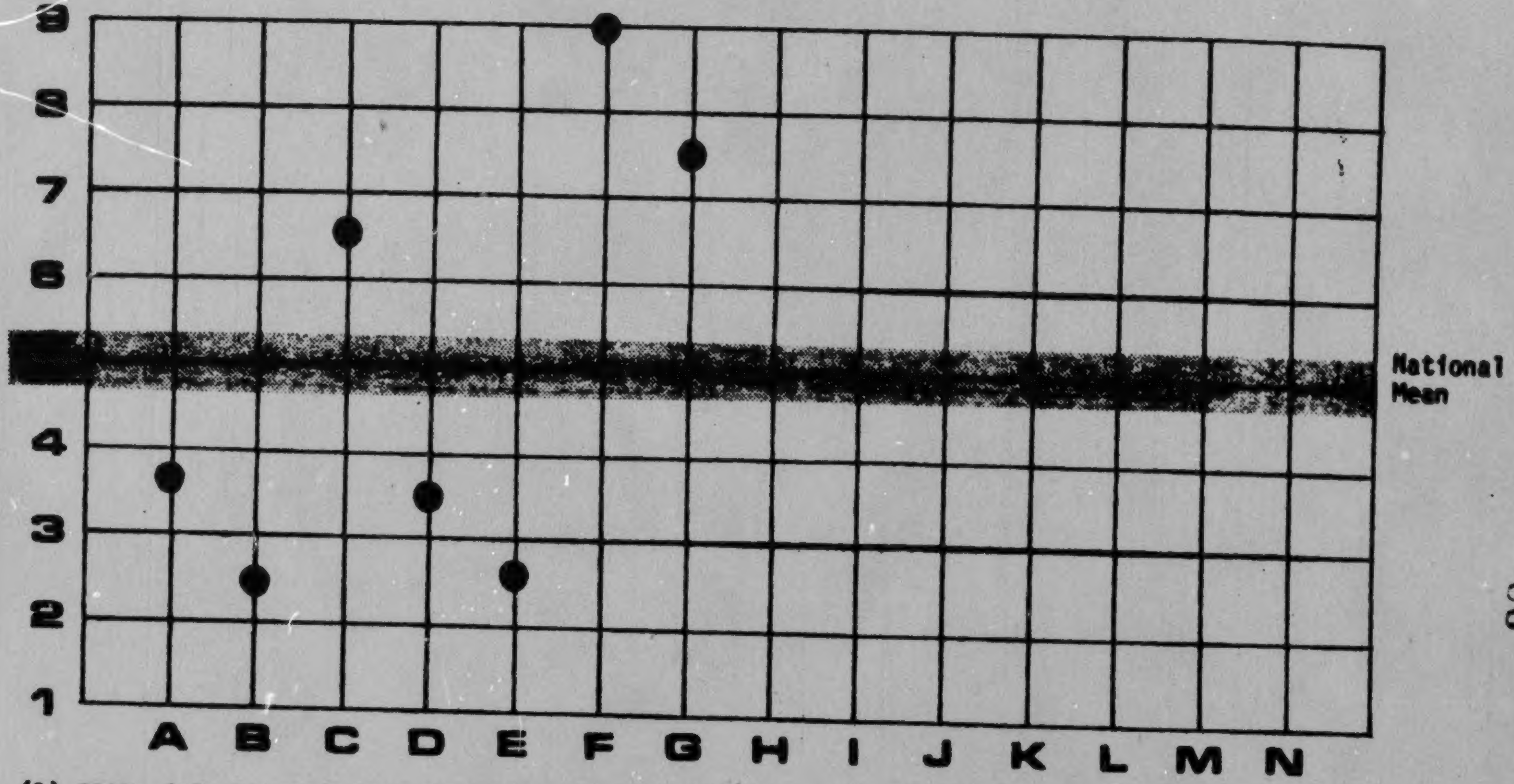


(1) POPULATION AND (2) CASE LOAD PROFILE FOR DELAWARE (1st Chart)

A.. Number Served 4758
B.. Percent Accepted for Services 44%
C.. Number of Rehabilitants 1624
D.. Number of Rehabilitants per 100,000 population 293
E.. Number of Rehabilitants per 10,000 Disabled 604

F.. Success Ratio 26/08+28+30 2:1
G.. Case Difficulty —
H.. Percent Severly Disabled —
I.. Number in Case Load per Counselor 54
J.. Number of Rehabilitants per Counselor 18

K.. Expenditures per Counselor $10,566
L..
M..
N..

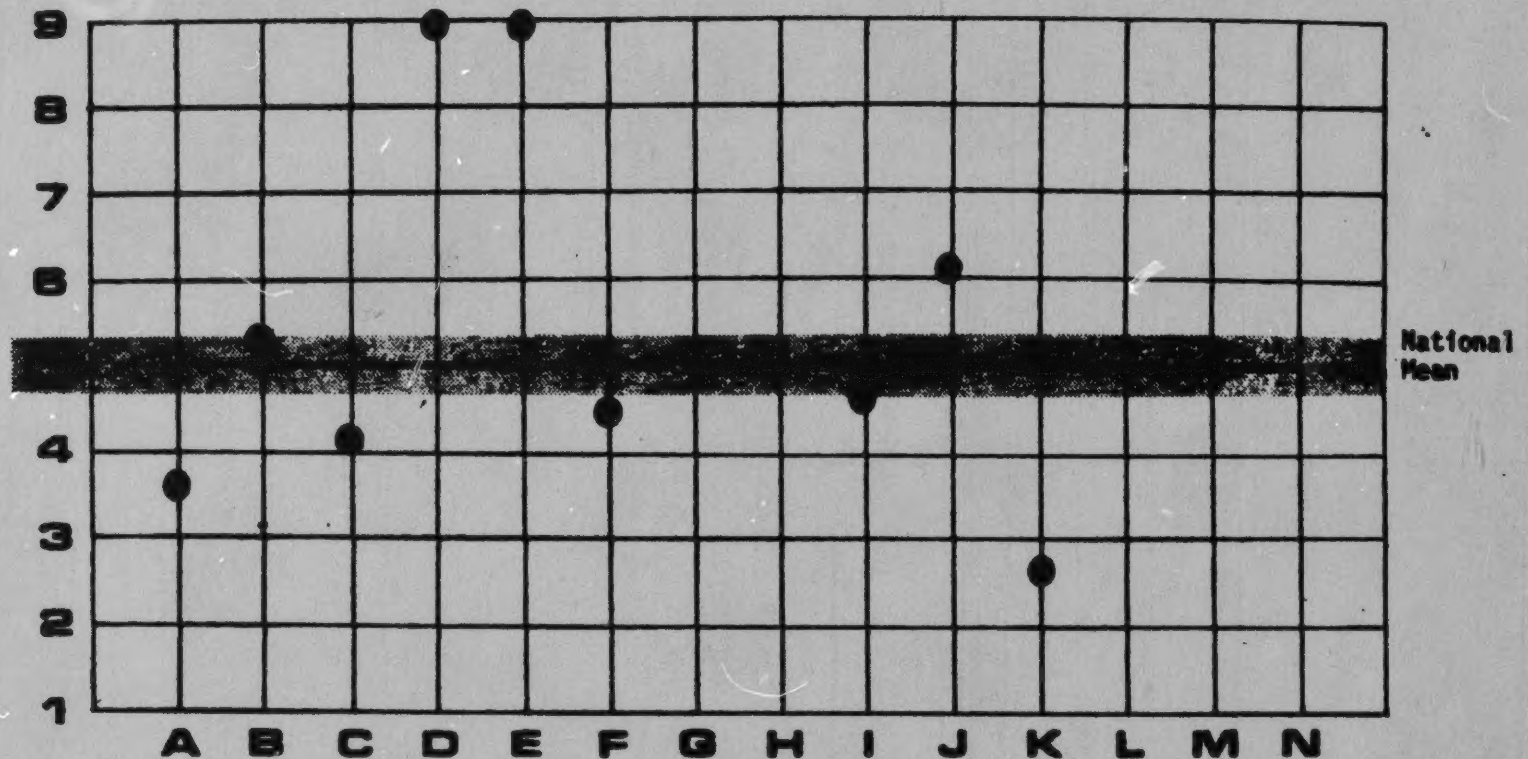


(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR Delaware (2nd Chart)

A.. Cost Per Rehabilitant $1971.00
B.. Cost-Diagnostic & Evaluation $26.00
C.. Cost-Physical or Mental Restoration $393.88
D.. Cost-Training $291.49
E.. Cost-Maintenance 182.00
F.. Cost-Services to Family Members $853.00

G.. Cost-Other Services $666.00
H.. Cost-Follow up Services ______
I.. Months-in 00-02 ______
J.. Months-in Evaluation 06 ______
K.. Months in Training 18 ______
L.. Months in 20-22 ______

M.. Months from Acceptance to Closure 10-24 ______
N.. Earnings at Closure ______
O.. Increase in Earnings from Acceptance to Closure ______
P.. Public Assistance at Closure ______
O.. Decrease in Public Assistance from Acceptance to Closure
R.. Occupational Level ______
S.. Increase in Physical Capacity & Mobility ______

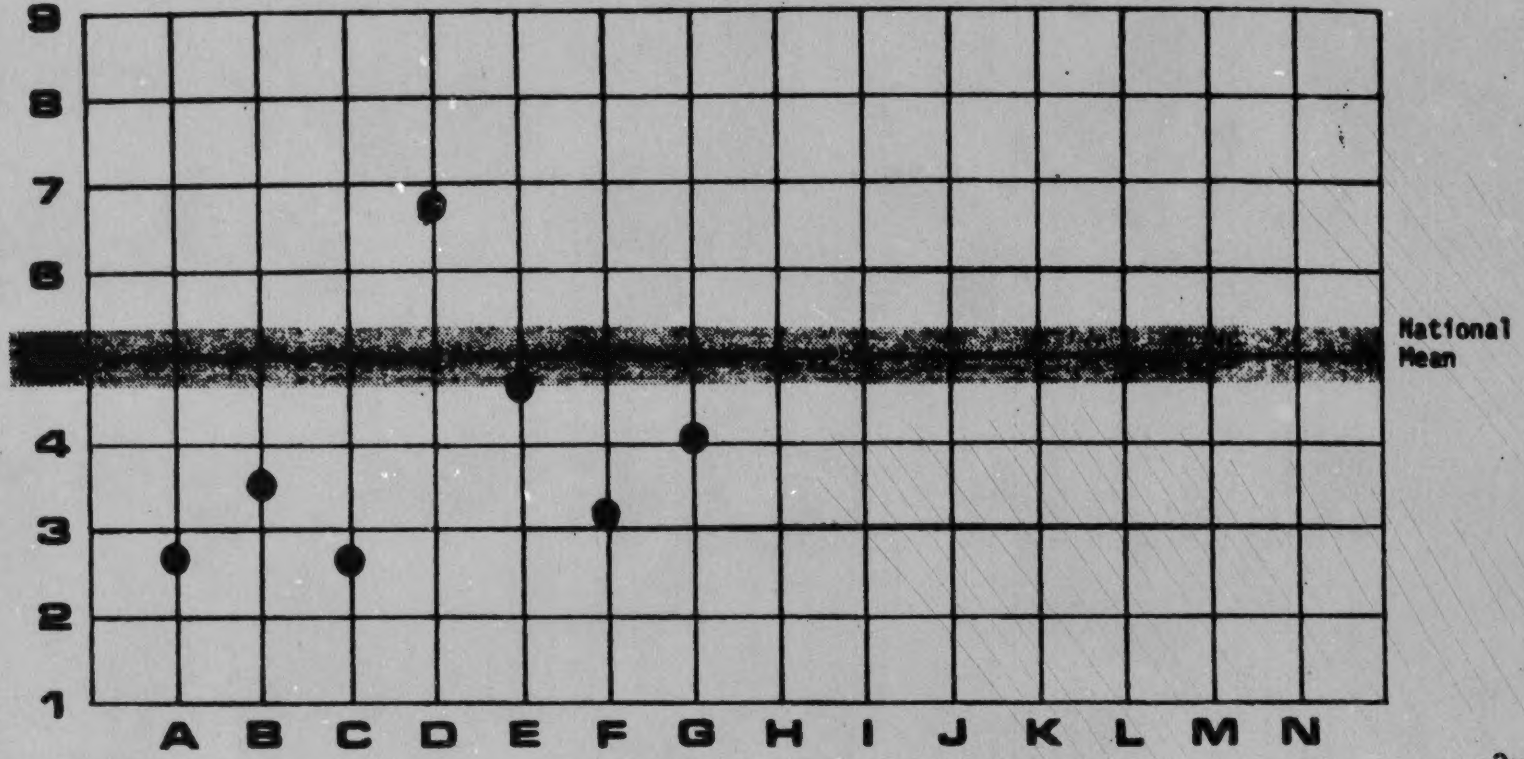


(1) POPULATION AND (2) CASE LOAD PROFILE FOR District of Columbia (1st Chart)

A.. Number Served 9106
B.. Percent Accepted for Services 54%
C.. Number of Rehabilitants 3537
D.. Number of Rehabilitants per 100,000 population 473
E.. Number of Rehabilitants per 10,000 Disabled 715

F.. Success Ratio 26/08+28+30 3:1
G.. Case Difficulty –
H.. Percent Severly Disabled –
I.. Number in Case Load per Counselor 127
J.. Number of Rehabilitants per Counselor 46

K.. Expenditures per Counselor $25,014
L.. ______
M.. ______
N.. ______

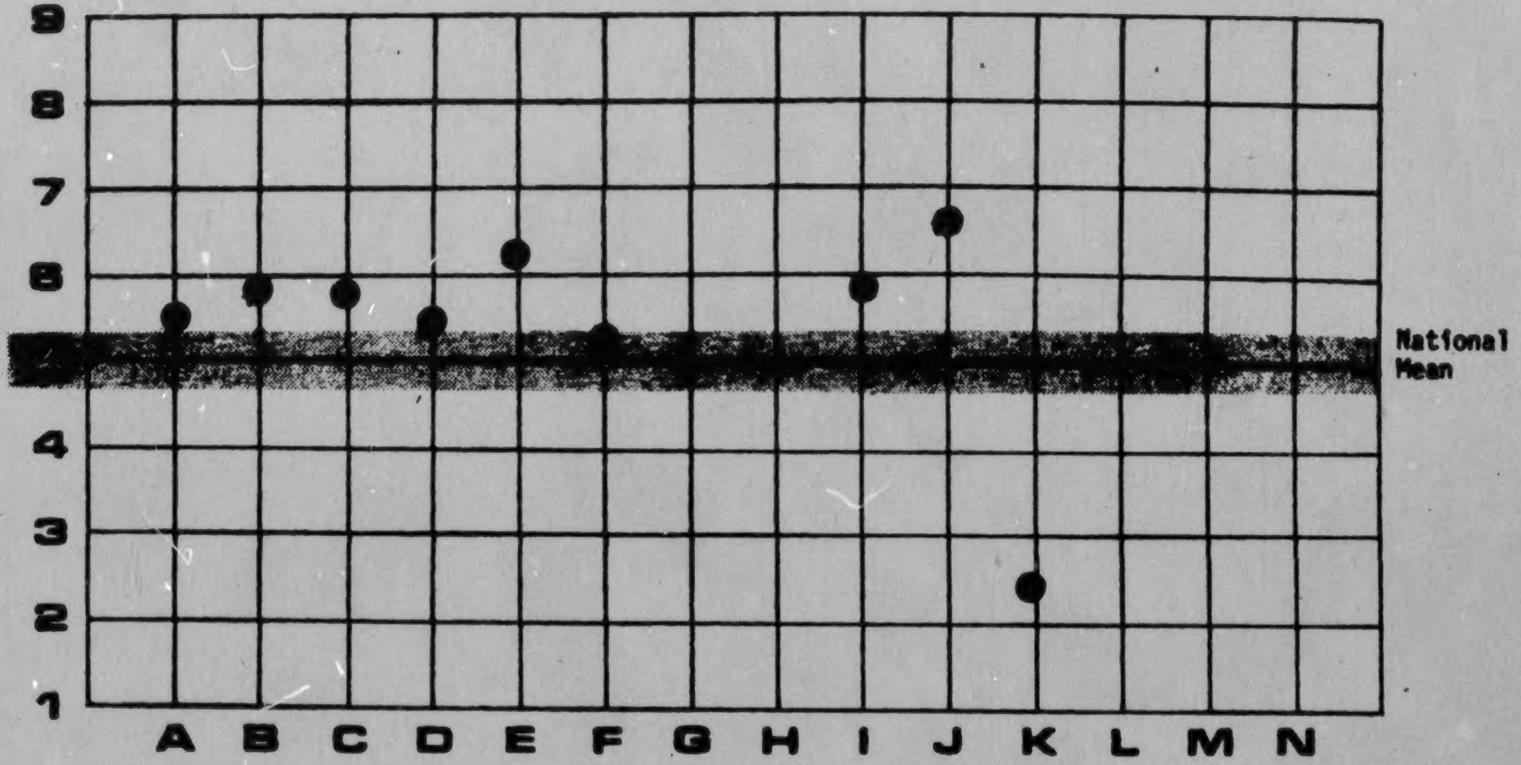


(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR DISTRICT OF COLUMBIA (2ND [redacted] CHART)

A.. Cost Per Rehabilitant $1550.00
B.. Cost-Diagnostic & Evaluation $55.00
C.. Cost-Physical or Mental Restoration $183.41
D.. Cost-Training $581.76
E.. Cost-Maintenance $390.00
F.. Cost-Services to Family Members $19.00

G.. Cost-Other Services $102.00
H.. Cost-Follow up Services —
I.. Months-in 00-02 ____
J.. Months-in Evaluation 06 ____
K.. Months in Training 18 ____
L.. Months in 20-22 ____

M.. Months from Acceptance ____ to Closure 10-24 ____
N.. Earnings at Closure ____
O.. Increase in Earnings from Acceptance to Closure ____
P.. Public Assistance at Closure ____
Q.. Decrease in Public Assistance from Acceptance to Closure ____
R.. Occupational Level ____
S.. Increase in Physical Capacity & Mobility ____

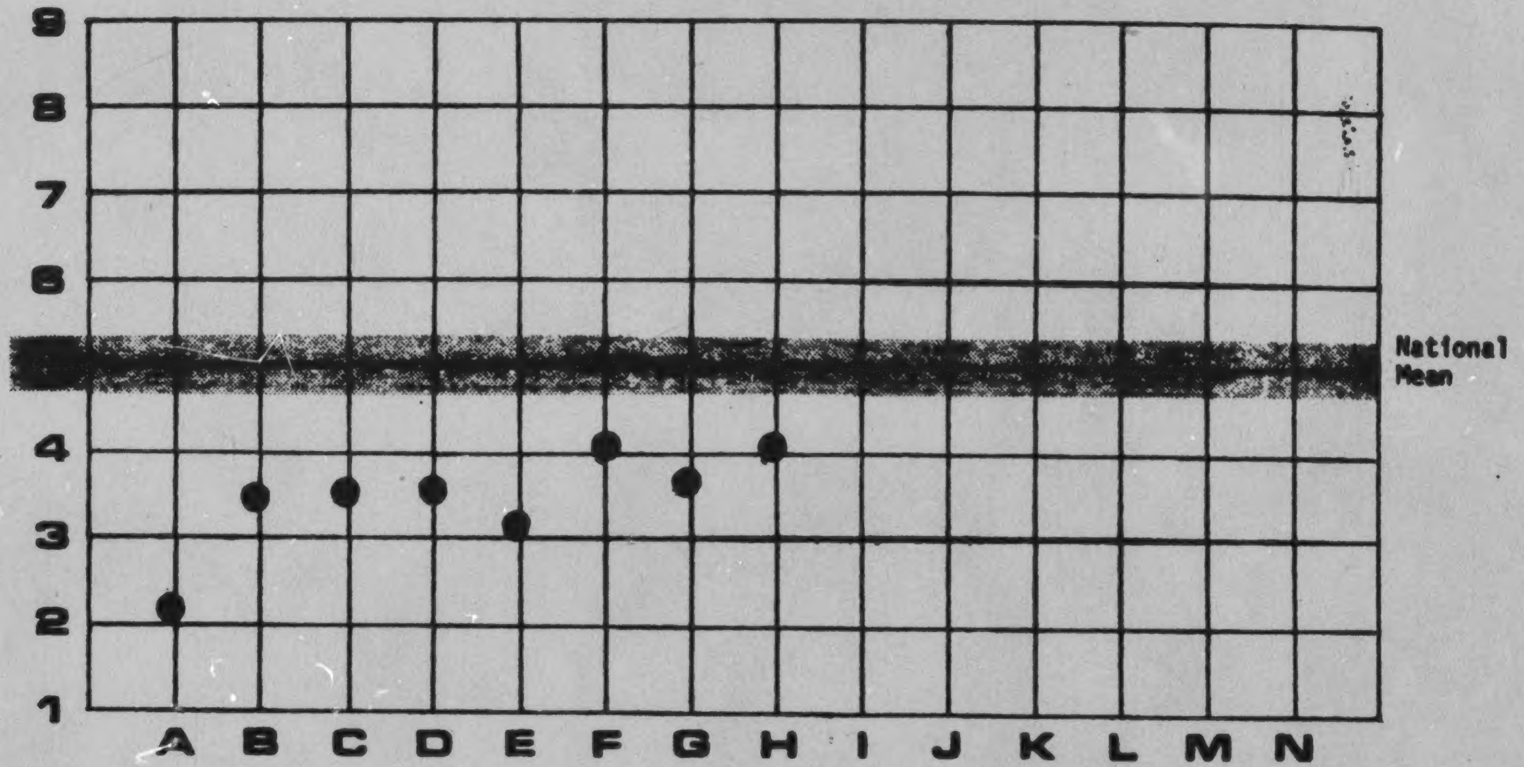


(1) POPULATION AND (2) CASE LOAD PROFILE FOR MARYLAND (1ST CHART)

A.. Number Served 26,774
B.. Percent Accepted for Services 57%
C.. Number of Rehabilitants 9123
D.. Number of Rehabilitants per 100,000 population 235
E.. Number of Rehabilitants per 10,000 Disabled 432

F.. Success Ratio 26/08+28+30 5.4:1
G.. Case Difficulty —
H.. Percent Severly Disabled —
I.. Number in Case Load per Counselor 156
J.. Number of Rehabilitants per Counselor 52

K.. Expenditures per Counselor $22,598
L..
M..
N..



(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR MARYLAND (2ND CHART)

A.. Cost Per Rehabilitant $1254.00

B.. Cost-Diagnostic & Evaluation $49.00

C.. Cost-Physical or Mental Restoration $227.26

D.. Cost-Training $301.94

E.. Cost-Maintenance $210.00

F.. Cost-Services to Family Members $129.00

G.. Cost-Other Services $73.00

H.. Cost-Follow up Services $62.00

I.. Months-in 00-02 ______

J.. Months-in Evaluation 06 ______

K.. Months in Training 18 ______

L.. Months in 20-22 ______

M.. Months from Acceptance to Closure 10-24 ______

N.. Earnings at Closure ______

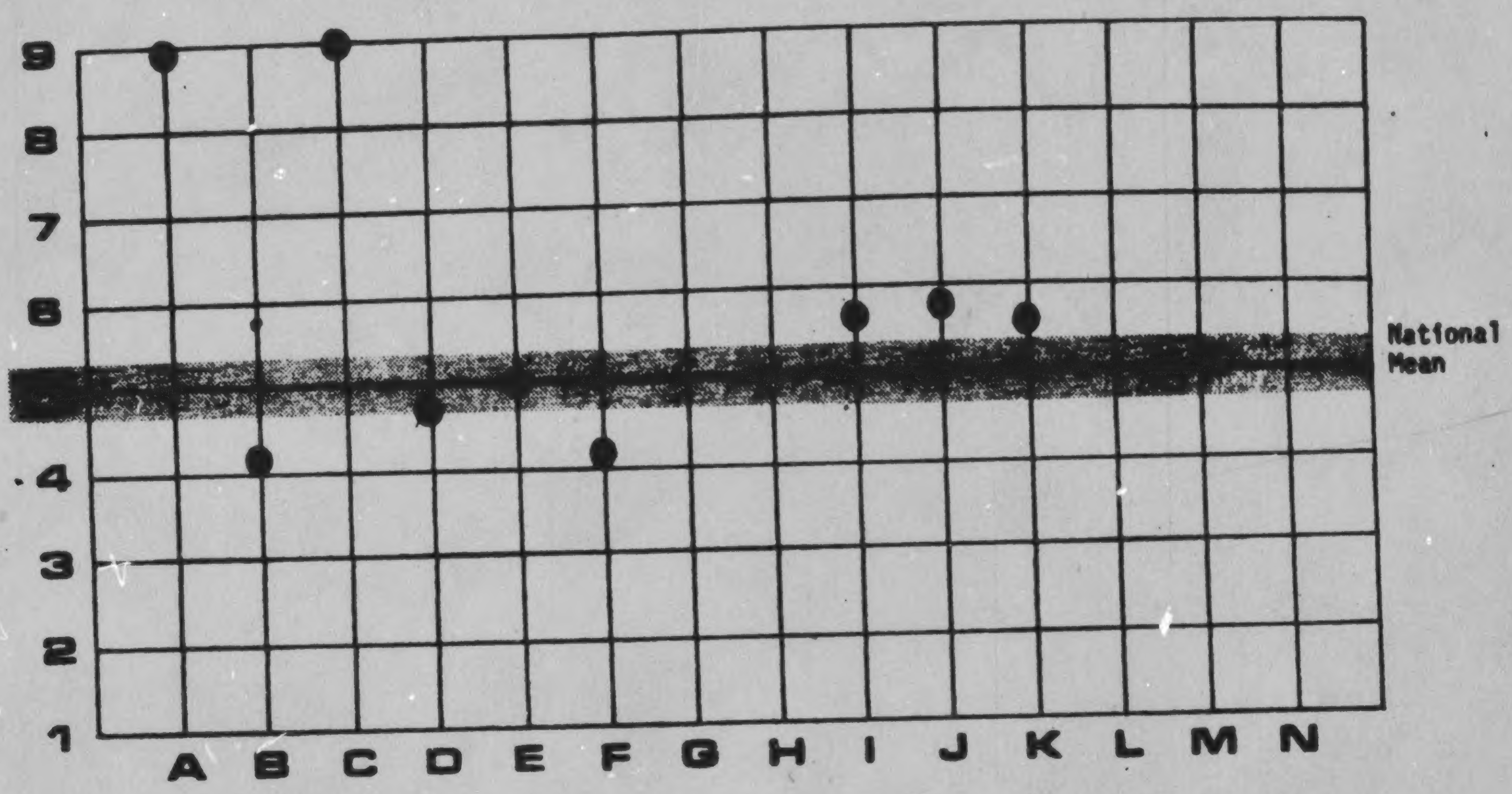
O.. Increase in Earnings from Acceptance to Closure ______

P.. Public Assistance at Closure ______

Q.. Decrease in Public Assistance from Acceptance to Closure ______

R.. Occupational Level ______

S.. Increase in Physical Capacity & Mobility ______

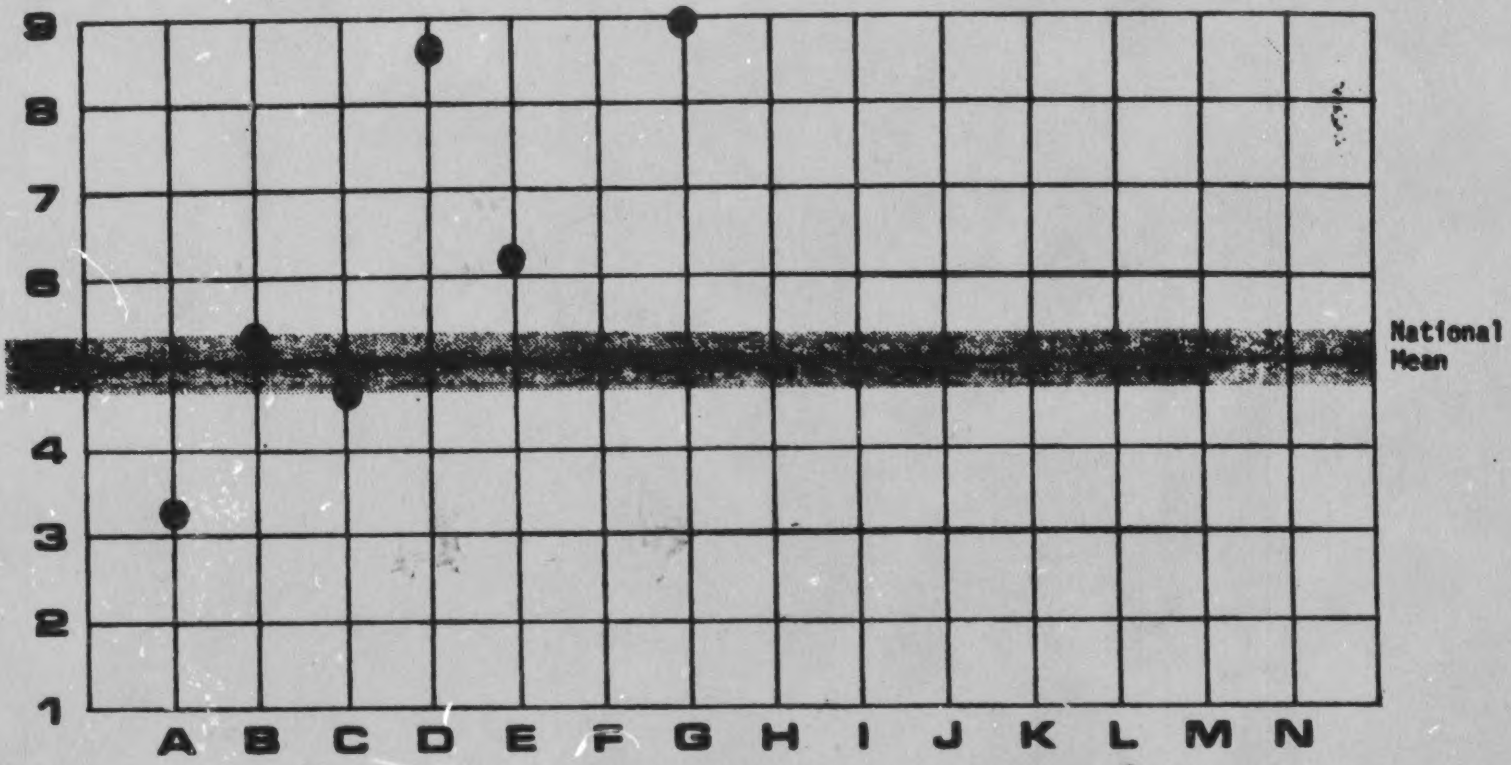


(1) POPULATION AND (2) CASE LOAD PROFILE FOR PENNSYLVANIA (1st CHART)

A.. Number Served 72,154
B.. Percent Accepted for Services 49%
C.. Number of Rehabilitants 21,390
D.. Number of Rehabilitants per 100,000 population 188
E.. Number of Rehabilitants per 10,000 Disabled 340

F.. Success Ratio 26/08+28+30 2.5:1
G.. Case Difficulty –
H.. Percent Severly Disabled –
I.. Number in Case Load per Counselor 155
J.. Number of Rehabilitants per Counselor 45

K.. Expenditures per Counselor $53,022
L.. ______
M.. ______
N.. ______

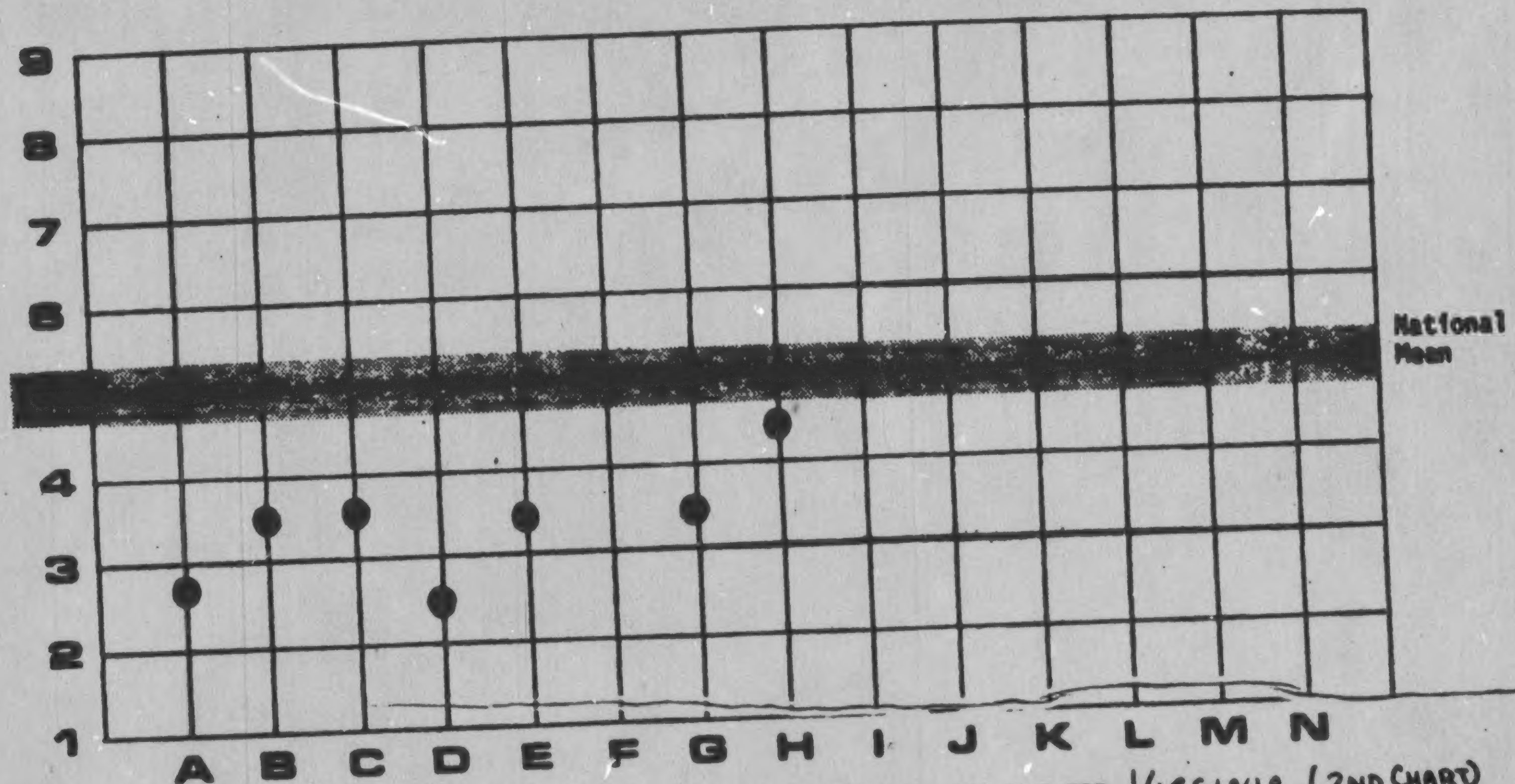


(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR Pennsylvania (2nd Chart)

A.. Cost Per Rehabilitant $1759.00
B.. Cost-Diagnostic & Evaluation $100.00
C.. Cost-Physical or Mental Restoration 296.84
D.. Cost-Training $748.44
E.. Cost-Maintenance $456.00
F.. Cost-Services to Family Members ______

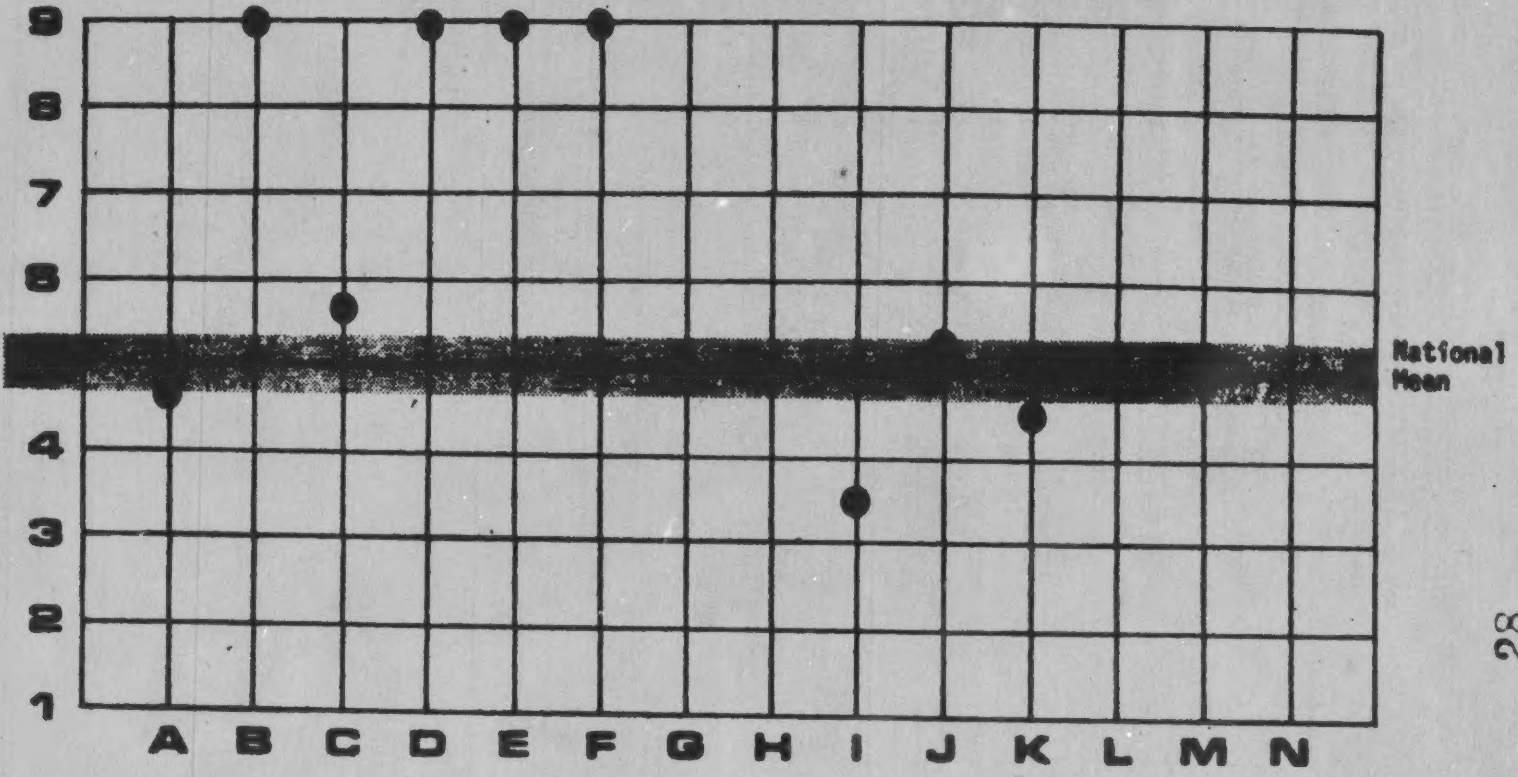
G.. Cost-Other Services $1359.00
H.. Cost-Follow up Services ______
I.. Months-in 00-02 ______
J.. Months-in Evaluation 06 ______
K.. Months in Training 18 ______
L.. Months in 20-22 ______

M.. Months from Acceptance to Closure 10-24 ______
N.. Earnings at Closure ______
O.. Increase in Earnings from Acceptance to Closure ______
P.. Public Assistance at Closure ______
Q.. Decrease in Public Assistance from Acceptance to Closure ______
R.. Occupational Level ______
S.. Increase in Physical Capacity & Mobility ______



(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR VIRGINIA (2ND CHART)

A.. Cost Per Rehabilitant $1549.00
B.. Cost-Diagnostic & Evaluation $52.00
C.. Cost-Physical or Mental Restoration $235.62
D.. Cost-Training $201.92
E.. Cost-Maintenance $235.00
F.. Cost-Services to Family Members —
G.. Cost-Other Services $45.00
H.. Cost-Follow up Services $22.00
I.. Months-in 00-02 ______
J.. Months-in Evaluation 06 ______
K.. Months in Training 18 ______
L.. Months in 20-22 ______
M.. Months from Acceptance to Closure 10-24 ______
N.. Earnings at Closure ______
O.. Increase in Earnings from Acceptance to Closure ______
P.. Public Assistance at Closure ______
Q.. Decrease in Public Assistance from Acceptance to Closure ______
R.. Occupational Level ______
S.. Increase in Physical Capacity & Mobility ______

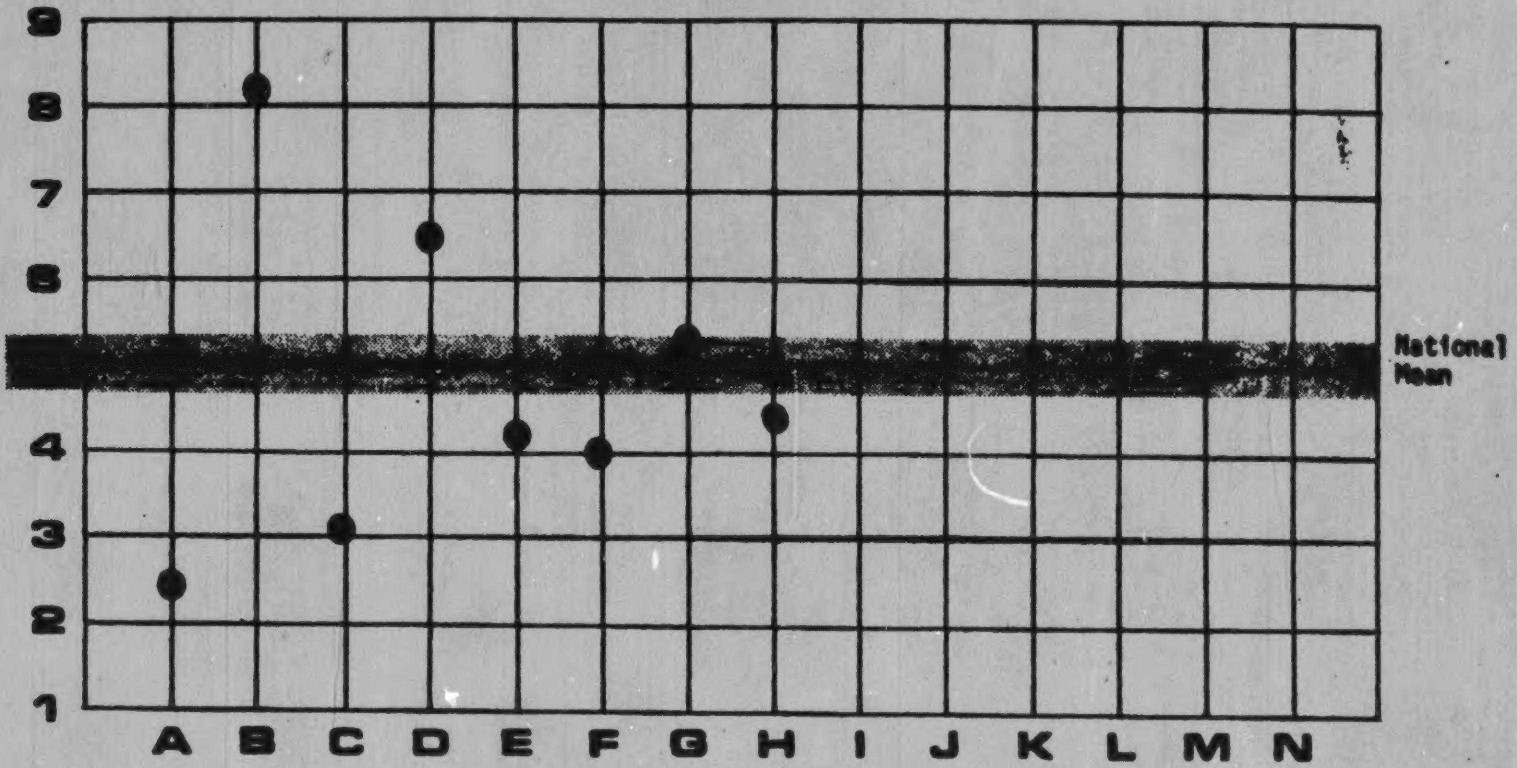


(1) POPULATION AND (2) CASE LOAD PROFILE FOR West Virginia (1st Chart)

A.. Number Served 19,603
B.. Percent Accepted for Services 78%
C.. Number of Rehabilitants 8,608
D.. Number of Rehabilitants per 100,000 population 483
E.. Number of Rehabilitants per 10,000 Disabled 698

F.. Success Ratio 26/08+28+30 11:1
G.. Case Difficulty —
H.. Percent Severly Disabled —
I.. Number in Case Load per Counselor 96
J.. Number of Rehabilitants per Counselor 40

K.. Expenditures per Counselor 42,986
L.. ______
M.. ______
N.. ______



(1) COST, (2) CASEFLOW AND MANAGEMENT, AND (3) CLIENT OUTCOMES PROFILE FOR West Virginia (2nd Chart)

A.. Cost Per Rehabilitant $1490.00
B.. Cost-Diagnostic & Evaluation $177.00
C.. Cost-Physical or Mental Restoration $200.30
D.. Cost-Training $201.52
E.. Cost-Maintenance $235.00
F.. Cost-Services to Family Members $121.00

G.. Cost-Other Services $304.00
H.. Cost-Follow up Services $54.00
I.. Months-in 00-02 6.1
J.. Months-in Evaluation 06 0.1
K.. Months in Training 18 3.2
L.. Months in 20-22 3.3

M.. Months from Acceptance to Closure 10-24 14.5
N.. Earnings at Closure $43.98
O.. Increase in Earnings from Acceptance to Closure 26.49
P.. Public Assistance at Closure $9.13
Q.. Decrease in Public Assistance from Acceptance to Closure $4.73
R.. Occupational Level ________
S.. Increase in Physical Capacity & Mobility ________

MicroAspects of Program Evaluation

Another possible aspect of program evaluation activity might probe more in depth into interrelationships. The same general types of questions are applicable, however, relationships within such factors may be examined to gain specific information within a program or within potential rehabilitation contributing variables. For example, these particular statistical analyses were computed for 10% of all the clients closed in any category from the fiscal year July 1, 1969 to June, 30, 1970 in W. Va.. Various questions about the program were examined from information recorded on the standard RSA-300 form. Who was accepted for services (Table 1), and of those accepted, who were successfully closed (Table 2)? What are the significant predictors of successful closure (Table 3), and what efforts, in time (Table 4) and money (Table 5) were needed to make them successful closures? What factors or characteristics are associated with reduction in public assistance (Table 6), least public assistance at closure (Table 7), greatest increase in weekly earnings (Table 8) and greatest weekly earnings at closure (Table 9)?

Some other potentially helpful analyses could not be conducted (e.g., for gain in physical capacity or mobility) since adequate information is not available from the RSA-300 form. Such demographic items as age, sex, referral source, education, marital status, and type of disability, often suggested as significant determiners of outcome, are however statistically verifiable.

Stratified Random Sample

The 10% sample was selected as follows: The total population was stratified into (a) the five closure types (00, 02, 26, 28, 30), (b) the 6 major disability types (1, 2, 3, 4, 5, 6), (c) the sex of the client (M, F) (d) the age of the client into three classifications (under 30, 31 to 50, 51 and above years of age). For each of these 5 X 6 X 2 X 3 cells 10% of cases were selected. Finer stratification was made within each of the six major disability types, and 10% random selection was made within these finer distributions to the extent possible. The final stratified random sample was drawn from the population giving a total of 1397 cases which was 10.06% of the total.

Table 1--Who is Accepted for Services?

Categories such as referral source produce statistically verifiable differences as to whether a client is or is not accepted for services. Within this category clients referred from a Social Security Disability Determination Unit had a remarkably poor rate of acceptance. Of the 283 clients referred by this source only 27 were accepted when one should expect 146.4 acceptances. This difference between the expected and observed values gives a chi-square value of 201.72 which is much less than .01 chance. Of the subcategories having a greater than expected rate of acceptance, those clients who were self-referred were most accepted. Of the 273 clients who were self-referred, 200 were accepted when only 141.2 would be expected to be accepted. This produced a chi-square of 50.68 which is also significant to the .01 level.

Other categories effecting acceptance were Sex--of the males 344 out of 804 were accepted when 415.9 should be expected to be accepted. This produced a chi-square value of 25.75 (significant at .01). Of the females 374 out of 584 were accepted when only 302 were expected to be accepted. This resultant chi-square value of 35.45 was also significant at the .01 level. The category of Disability as Reported had significant breakdowns (eg., only 2 out of 28 clients with Emphysema (Code 651) were accepted when one would expect 14.5 acceptances.) This produced a chi-square value of 22.29 ($p < .01$). Clients whose Disability as Reported was Conditions of Teeth and Supporting Structures (Code 660) were accepted (148 out of 179) more often than expected (92.6) to produce a chi-square value of 68.68 significant at .01. Analysis of variance was used on continuous variables such as Months in Status 00 to 02. Clients in this status 8.7 months or more (N=648) were significantly ($\underline{p} < .01$) less accepted than those clients who were in that status 3.5 months or less (N=636). This means that the shorter the duration of time between Referral (status 00) and Application (status 02) the better the chance of acceptance. Direct examination of Table 1 reveals many other factors significantly related to acceptance for services.

Table 2--Of Those Accepted, Who is Successfully (Status 26) Closed?

This table represents the statistically discreet attributes of those clients who were closed successfully. Chi-square analyses were again used on non-continuous variables and showed for example that the client's Major Disability affected his chance of successful closure. Clients whose Major Disability was classified as a psychotic disorder (Code 500) were successfully closed in only 16 out of 34 instances when 29.2 should be expected to be successful. The resultant chi-square value of 41.86 is significant at the .01 level. A Major Disability type with a greater than expected rate of success was Conditions of Teeth and Supporting Structures (660) which were successfully closed in 136 out of 141 cases when only 121 would be expected to be successful. This produced a chi-square value of 13.15 also significant at $< .01$.

The continuous variables were analyzed by analysis of variance. Education proved to be a significant determiner because the 607 out of 616 who were closed successfully had a 9th grade or higher education while 101 out of 102 unsuccessful closures had a less than 9th grade education. This produced an *F* value of 5.81 which is significant at the .05 level. As another example, the successful closures were marked by taking significant less time (mean = 13 months) from acceptance to closure (status 10 to 24) than those clients closed unsuccessfully (mean = 24 months). The resulting *F* value was 41.33 which is significant at $< .01$. In this table positive values were assigned to those items having a significantly greater than expected rate of success while negative values were given to those items significantly less successful than expected. The magnitude of the positive or negative value was given to the level of significance $< .05$ was assigned a value of 1 while $< .01$ had a value of 2.

Table 3-Predicting Successful (Status 26) and Unsuccessful (Status 08, 28, 30) Closure from RSA-300 Intake Data

This table notes the rate of successful closures as determined by information obtained in Part 1 and Part 2 of the RSA-300 form (that information recorded at the completion of the referral process and before acceptance). Referral Source was again significant with self-referrals (70) having a greater than expected rate of acceptance--190 out of 273. This produced a highly significant chi-square value of 70.32. Other referral sources had poor rates of acceptance. Clients referred by the SSDI Determination Unit (50) were closed successfully in only 20 out of 283 cases. The resultant chi-square was 159.63 which is significant at $<.01$. Further, those clients who were not applicants for SSDI were successful more often than expected 562 out of 1006 (Chi-square value 44.92, significance $<.01$), while the other SSDI statuses were less successful than expected (e.g., allowed benefits (1) 28 out of 140 successful giving a chi-square of 33.71 with a $<.01$ level of significance).

Analysis of variance was used for computation with continuous variables such as Months in Status 00-02. This analysis showed that clients who were in this status longer (8 or more months), were successfully closed significantly less than those in this status a shorter time (3 months or less). This analysis produced an F value of 101.6 which is significant at $<.01$.

The categories of Disability as Reported and Major Disability were covered in supplements 3A and 3B respectively to include all 1, 2, or 3 digit disability codes that were significant. An example from 3A-Disability as Reported was code 5--, mental disorders; 206 of 289 successful, chi-square 84.58, $p<.01$; 52-, other mental disorders 13 of 80 successfully closed, chi-square 25.5, $p<.01$; 520, alcoholism, 9 of 38 successful, chi-square 6.58, $p < .05$; 522 character, behavior and personality disorders, 3 of 37 successful, chi-square 19.72, $p < .01$. This shows that while 5--'s in general are successfully closed, the 52-'s have a poor rate of success, with 522's generally less successful than 520's.

Table 4-Of Those Closed Successfully (Status 26), Which Cases Required the Most Time?

This table gives the mean time, in months from acceptance to closure (Status 10-24) of the significant indicators. Since time was a continuous variable, other continuous independent variables were split into logical sub-categories so that they and the non-continuous variables could be treated as independent variables in the analyses of variance. Age was treated in this manner. The analysis of variance yielded an F value of 15.8 significant at $< .01$. The Duncan multiple comparisons test was used to compute the significance of the stratified subcategories. The results showed that clients over 60 took less time (8.1 months) than those clients age 40-49 (10.6 months) and much less than those clients age 19 or less (24.7 months.) Non-continuous independent variables were treated in the same manner except in a category with only 2 parts such as sex where no Duncan test was needed. Males took longer (15.4 months) than females (11.1 months), $F = 14.5$, $p < .01$.

This table has two major uses (a) predicting the length of time to successfully close a particular type of case or (b) as a standard to compare a counselors efficiency in amount of time expended.

Table 5-Of Those Clients Closed Successfully (Status 26), Which Cases Required the Most Money?

This table gives the mean cost of case services in dollars of all services-total. The dependent variable dollar expenditure was treated in the same manner as time in Table 4 in that analysis of variance and Duncan multiple range test were used to determine areas of statistical difference. Age again was a significant determiner ($F = 8.44$, $p < .01$) with the youngest clients, those 19 years or less, requiring more money ($1015.81) than any other age group. The client's marital status also proved significant ($F = 7.97$, $p < .01$). The single clients cost more per person ($872.15) than any other group--married $448.52, widowed $404.69, divorced $577.82, or separated $415.38.

It has often been suggested that the more money put into a case the greater the client's earning potential would be. This idea did indeed hold up statistically ($F = 4.93$, $p < .01$). The 71 clients who earned $100 or more per week at closure cost an average of $1001.63 while the 131 clients who had no weekly earnings cost $525.96 per person. As expected, since earnings differ according to type of occupation, the occupational code was also a significant determiner ($F = 3.71$, $p < .01$). Those clients who were employed in professional, technical and managerial occupation at closure cost more to successfully rehabilitate ($1281.45 per person) than any other major type, while those employed in farming and related occupations cost the least ($295.43 per person) to successfully rehabilitate. Since it would be expected that the professional technical and managerial occupations generally were more highly educated, it is consistent that those clients who were college graduates would also have the highest case cost. This proved to be true since they had a mean cost of $1191.29 significantly ($F = 7.29$, $p < .05$) more than any other educational category.

Table 6-Which Clients Showed the Greatest Reduction in Public Assistance per Month?

This table displays the mean reduction in all types of public assistance per month between intake and closure for each significant category. Since Amount of Public Assistance is a continuous variable, analysis of variance and Duncan analyses were again used. Referral source, again a significant determiner, ($F = 7.26$, $p < .01$) revealed that those clients referred by welfare agencies had the greatest reduction in assistance at closure. The 80 clients were reduced by a mean of $33.00(a total savings of $2640.00 per month). Clients whose total monthly family income at entry was low ($150.00-199.99) had greater reduction in assistance $30.20 than any other entry income category (_F_ = 5.05, $p < .01$). Logically, if the source of support at entry was Public Assistance the reduction would be affected more. This notion was validated since the 78 clients whose support was Public Assistance were reduced $78.70 (a total reduction of $6138.60 per month), _F_ = 58.7, $p < .01$. Remembering that this is a 10% sample and multiplying that saving by 10 produces a saving of more than $60,000 per month in that category.

Table 7-Which Clients Showed Least Public Assistance per Month at Closure?

This table explores the characteristics of clients receiving public assistance at closure. Referral source is again a significant determiner (_F_ = 7.98, $p < .01$). The Duncan multiple range tests were used to determine differences within the category. Welfare agencies had the highest mean ($39.96 N=50), while those clients referred by private organizations and health organizations and agencies had the lowest means (0.0, N=15 and 0.0, N=20 respectively). Marital Status was also significant (_F_ = 4.87, $p < .05$). The separated clients had the highest mean assistance amount of $20.18 while the single clients had a mean amount of $2.68.

As expected from Table 6 those clients whose primary source of support at entry was Public Assistance also had the highest amount of assistance at closure ($98.85). The overall category of source of support was again significant ($\underline{F} = 53.3$, $\underline{p} < .01$).

Table 8-Which Clients Showed Greatest Increase in Weekly Earnings?

This table shows positive effects of the rehabilitation process in terms of the difference between the clients' weekly earnings at entry and at closure. Analysis of variance and the Duncan multiple range test were used because increase in weekly earnings was treated as a continuous dependent variable. The category Age was again a significant variable ($\underline{F} = 5.05$, $\underline{p} < .01$). Acceptance or non-acceptance produced an $\underline{F}$ value of 165.6, $\underline{p} < .01$. The clients who were not accepted actually had an average reduction of $13.70 in weekly earnings while the clients who were accepted increased their weekly earnings by $23.10.

As suggested in Table 5, greater expenditures generally resulted in a greater rate of success; this proved to also be true in increase in earnings. The amounts of money spent by Rehabilitation Facilities or by Social Security Trust Funds were significant determiners with a mean increase of $12.30 ($\underline{F} = 12.3$ and 4.47, both significant at $\underline{p} < .01$). These clients on whom $1001 or more was spent by Rehabilitation Facilities had the greatest increase of \$59.10 per week, and the clients on whom \$1001 or more was spent from Social Security Trust Funds also had the greatest increase in weekly earnings in that category (\$114.00).

The indication from Table 4 concerning the length of time being a significant factor was borne out by the category months in training (Status 18) ($\underline{F} = 47.1$, $\underline{p} < .01$). The clients who were in this status 19 months or more had a weekly increase of \$77.70 while the lowest increase (\$7.80) was shown by the clients who were in this status 6 months or less.

Table 9-Which Clients Showed Greatest Weekly Earnings at Closure?

This table characterizes those clients who were earning most per week at closure. Age produced an $\underline{F} = 7.17$, $\underline{p} < .01$. Clients age 19 or less earned the most (\$63.20) per week while the oldest clients (over 60 years of age) earned least (\$20.10) per week. Major Disability was also a significant ($\underline{F} = 3.07$, $\underline{p} < .01$) determiner. Clients whose Major Disability was absence or amputation (4--) earned most at closure (\$61.30 per week), while those clients whose disability type was mental or personality disorder (5--) had lowest (\$33.20) weekly earnings at closure.

Education again proved to be a significant factor ($\underline{F} = 15.5$, $\underline{p} < .01$). Clients with the greatest amount of education (16th or more - college graduate) earned most at closure - $74.10 per week. However, those with least education (less than 9th grade) earned $33.70 per week, which was the lowest amount for this category. As indicated in Table 4 and Table 8 the greater the length of time spent the better the results for category Months in Training (Status 18, $\underline{F} = 11.9$, $\underline{p} < .01$). The clients who spent the most time in training (19 months or more) earned most ($85.20 per week), while the clients who spent least time in Status 18 (6 months or less) earned least ($40.70 per week).

Overview of Tables 1-9

There were several categories, a number of which are often suggested by counselors in the field, that were significant determiners of rehabilitation outcome. That is, some variables showed up in several tables as significant contributions to rehabilitation or non-rehabilitation. The categories that were most prevalent are summarized in the following chart.

TABLES 1 through 9 SUMMARY

CATEGORY	1	2	3	4	5	6	7	8	9
Referral Source	X	X	X	X		X	X		X
Age				X	X	X	X	X	X
Sex	X	X	X	X					
SSDI Status	X	X				X	X		
Disability as Reported	X	X	X	X					
Major Disability	X	X	X	X					X
Marital Status	X	X	X	X	X		X		X
Education		X	X	X	X				X
Cost		X		X				X	X
Time in Status		X	X	X	X	X	X	X	X
Weekly Earnings Entry	X	X	X	X	X				X
Weekly Earnings Closure		X		X	X				

TABLE 1

WHO IS ACCEPTED FOR SERVICES?

10% SAMPLE FY 69-70

P-300 Part & Letter	Category	Subcategory	Accepted	Not Accepted	X^2 or F	Prob.	Value
1-D	Referral Source	a. General Hospital (24)	17	4	7.18	<.01	+2
		b. Other Hospital (29)	16	3	8.03	<.01	+2
		c. S.S. Disability Determination (50)	27	256	201.72	<.01	-2
		d. Correctional Institution (56)	10	25	7.52	<.01	-2
		e. Artifical Appliance (60)	13	1	9.48	<.01	+2
		f. Self Referred (70)	200	73	50.68	<.01	+2
		g. Physician (72)	92	33	23.95	<.01	+2
		h. Other (79)	112	58	13.64	<.01	+2
		TOTAL	718	670			
1-F	Sex	a. Male (1)	344	460	25.75	<.01	-2
		b. Female (2)	374	210	35.45	<.01	+2
		TOTAL	718	670			
1-G	Disability As Reported	a. Ill Defined Orthopedic Diseases (383)	2	10	5.91	<.05	-1
		b. Arthritis Rheumatism (390)	3	11	5.15	<.05	-1
		c. Accidents Ill Def. Ortho. Injuries (399)	30	55	9.19	<.01	-2
		d. Lower Extremity accidents (439)	14	4	4.89	<.05	+1
		e. Psychoneurotic Disorders (510)	16	33	7.14	<.01	-2
		f. Other Behavior Disorders (522)	7	30	15.95	<.01	-2
		g. Other Disorders of Nervous System (639)	7	17	4.89	<.05	-1
		h. Artereosclerotic Ht. Dis. (642)	1	19	17.49	<.01	-2
		i. Emphysema (651)	2	26	22.29	<.01	-2
		j. Other Dis of Resp. System (659)	9	20	11.82	<.01	-2
		k. Conditions of Teeth (660)	148	31	68.68	<.01	+2
		l. Hernia (663)	15	3	7.20	<.01	+2
		m. Conditions of Genito-urinary (670) System	27	7	10.43	<.01	+2
		TOTAL	718	670			

TABLE 1 (con't)

R-300 Part Letter	Category	Subcategory	Accepted	Not Accepted	χ^2 or F	Prob.	Value
2 - B	SSDI Status at Referral	a. Not applicant (0)	646	380	51.85	<.01	+2
		b. Applicant - allowed (1)	38	102	33.89	<.01	-2
		c. Applicant - denied (2)	18	112	74.72	<.01	-2
		d. Applicant - pending (3)	16	61	29.54	<.01	-2
		e. Not known (4)	0	12	12.86	<.01	-2
		TOTAL	718	670			
2 - E	Months in Status 00 to 02	a. 8.7 mo.or more		648	F=166.8	<.01	-2
		b. 3.5 mo. or less	636			<.01	+2
2 - H1	Major Disability	a. Ill-Def. Accidental Ortho Injuries (399)	28	37	9.09	<.01	-2
		b. Low extremities Acc. Injuries (439)	14	1	6.47	<.05	+1
		c. Other Disorders of Nervous System (639)	9	16	6.73	<.01	-2
		d. Artereosclerotic Deg. Heart Disorder (642)	2	11	11.55	<.01	-2
		e. Emphysema (651)	1	15	20.15	<.01	-2
		f. Other Disorders of the Resp.System (659)	4	11	7.60	<.01	-2
		g. Conditions of teeth (660)	141	22	43.64	<.01	+2
		h. Hernia (663)	17	3	4.73	<.05	+1
		i. Conditions of Genito-Urinary (670) System	34	7	8.08	<.01	+2
		TOTAL	718	454			
2-H2	Secondary Disability	a. Visual Impairments (1)	62	9	8.91	<.01	+2
		b. Orthopedic Deformity (3)	22	1	6.66	<.01	+2
		c. Mental Disorder (5)	27	2	6.73	<.01	+2
		d. Unknown Etiology (6)	179	34	16.88	<.01	+2
		e. None (9)	414	241	20.95	<.01	+2
		TOTAL	718	290			
2-I	Previous Closure	a. Yes, Rehab(2)	55	9	9.19	<.01	+2
		TOTAL	718	325			
2-J	Marital Status	a. Divorced (3)	64	16	4.30	<.05	+1
		b. Never Married (5)	227	128	4.78	<.05	-1
		TOTAL	718	319			

TABLE 1 (con't)

R-300 Part & Letter	Category	Subcategory	Acc-epted	Not Acc-epted	χ^2 or F	Prob.	Value
2-N	Work Status	a. competitive (1)	227	63	9.24	<.01	+2
		b. other (8)	324	180	8.12	<.01	-2
		TOTAL	718	307			
2-O	Weekly Earnings at Entry	a. $3.71 or less		293	F=5.37	<.05	-1
		b. $18.04 or more	671			<.05	+1
2-Q	Type of Public Assistance	a. APTD (3)	6	10	7.92	<01	-2
		TOTAL	684	296			
2-R	Source of Family Support	a. Current Earnings (0)	200	55	8.63	<01	+2
		b. Public Assistance Partly Fed. (3)	45	33	5.62	<05	-1
		c. Other Insurance Benefits (8)	69	12	8.89	<01	+2
		TOTAL	700	301			
3-A	Federal Program Identif.	a. None (0)	654	541	10.68	<.01	+2
		b. S.S. Dis. Ben. Trust Fund (1)	20	87	46.07	<01	-2
		c. Public Offender (20)	5	18	8.08	<01	-2
		TOTAL	685	649			

TABLE 2

OF THOSE ACCEPTED, WHO IS SUCCESSFULLY (STATUS 26) CLOSED?

10% SAMPLE FY 69-70

P-300 Part & Letter	Category	Subcategory	Successful (26)	Unsuccessful (28 & 30)	χ^2 or F	Prob.	Value
1-D	Referral Source	a. Mental Hospital (20)	27	31	73.28	<.01	-2
		b. Public Welfare Agency (40)	34	16	12.99	<.01	-2
		c. Correctional Institution (56)	4	6	17.21	<.01	-2
		d. Self-referred (70)	190	10	13.91	<.01	+2
		e. Other (79)	104	8	4.58	<.05	+1
		TOTAL	616	102			
1-F	Sex	a. Male (1)	270	74	15.06	<.01	-2
		b. Female (2)	346	28	13.86	<.01	+2
		TOTAL	616	102			
1-G	Disability as Reported	a. Lower Limbs-Accidents (379)	11	5	3.81	<.05	-1
		b. Psychotic (500)	20	18	34.29	<.01	-2
		c. Alcoholism (520)	9	7	11.46	<.01	-2
		d. Conditions of Teeth (660)	143	5	14.24	<.01	+2
		TOTAL	616	102			
2-B	SSDI at Referral	a. Applicant-Allowed (1)	28	10	4.57	<.05	-1
		b. Applicant-Pending (3)	10	6	7.12	<.01	-2
		TOTAL	616	102			
2-H1	Major Disability	a. Other visual Impairments Ill Defined (149)	35	1	3.86	<.05	+1
		b. Psychotic Disorders (500)	16	18	41.86	<.01	-2
		c. Alcoholism (520)	7	8	18.84	<.01	-2
		d. Other Behavior Disorders (522)	16	7	10.15	<.01	-2
		e. Conditions of Teeth (660)	136	5	13.15	<.01	+2
		TOTAL	616	102			
2-J	Marital Status	a. Single (5)	183	44	4.99	<.05	-1
		TOTAL	616	102			
2-M	Highest Grade Completed	a. 9th grade or more	607		F=5.81	<.05	+1
		b. Less than 9th grade		101		<.05	-1

TABLE 2 (con't)

R-300 Part & Letter	Category	Subcategory	Successful (26)	Unsuccessful (28 & 30)	X^2 or F	Prob.	Value
2-N	Work Status At Entry	a. Competitive (1)	218	9	19.53	<.01	+2
		b. Homemaker (5)	83	4	6.59	<.05	+1
		c. Other (8)	245	79	27.53	<.01	-2
		TOTAL	615	102			
2-O	Weekly Earnings At Entry	a. > $21.22	595		.F=19.39	<.01	+2
		b. < $ 5.88		99		<.01	-2
2-P	Total Monthly Family Income	a. > $225.	596		F=10.42	<.01	+2
		b. < $175.		94		<.01	-2
2-R	Source of Family Support	a. Current Earnings (0)	193	7	18.31	<.01	+2
		b. Public Assistance (3)	34	11	4.08	<.05	-1
		c. Public Insitution (5)	23	34	98.65	<.01	-2
		TOTAL	586	98			
3-A	Federal Program Ident.	a. S.S. Beneficiary Trust Fund (1)	10	10	20.80	<.01	-2
		TOTAL	587	98			
3-B1	Cost of All Services	a. > $580.20	615		F=19.81	<.01	+2
		b. < $185.67		101		<.01	-2
3-E	SSDI Status at Closure	a. Not applicant (0)	37	14	7.06	<.01	-2
		TOTAL	566	95			
3-F	Work Status At Closure	a. Competitive (1)	434	6	41.25	<.01	+2
		b. Self employed (3)	25	0	4.09	<.05	+1
		c. HOmemaker (5)	120	3	9.21	<.01	+2
		d. Other (8)	1	60	476.3	<.01	-2
		TOTAL	612	75			
3-G	Weekly Earnings At Closure	a. >$49,45	594		F=84.31	<.01	+2
		b. <$ 5.88		99		<.01	-2

TABLE 2 (con't)

R-300 Part & Letter	Category	Subcategory	Successful (28)	Unsuccessful (28 & 30)	χ^2 or F	Prob.	Value
3-G	Amount of Pub. Assistance at Closure	a.< $7.75 b.> $18.10	536	84	F=8.27	<.05 <.05	+1 -1
3-J2	Months in Status 10 to 24 Acceptance to Closure	a. < 13 months b. > 24 months	614	101	F=41.33	<.01 <.01	+2 -2
3-J4	Months in Status 20 to 22 Ready For Employment	a. > 3.6 months b. < 1 month	600	93	F=18.30	<.01 <.01	+2 -2

TABLE 3
PREDICTING SUCCESSFUL (STATUS 26) AND UNSUCCESSFUL (STATUS 08, 28, 30) CLOSURE FROM R-300 INTAKE DATA

10% Sample FY 69-70

R-300 Part & Letter	Category	Subcategory	Succ. (26)	Unsucc. (08, 28, 30)	χ^2 or F	Prob.	Value
-D	Referral Source	a. Mental Hospital (20)	27	84	23.85	<.01	-2
		b. General Hospital (24)	15	6	6.23	<.05	+1
		c. Other Hospital or Clinic (29)	13	6	4.45	<.05	+1
		d. SSDI Determination Unit (50)	20	263	159.63	<.01	-2
		e. Corrections (56)	4	31	15.39	<.01	-2
		f. Artif. Appliance Co. (60)	13	1	13.34	<.01	+2
		g. Self-Referral (70)	190	83	70.32	<.01	+2
		h. Physician (72)	83	42	24.54	<.01	+2
		i. Other individual (79)	104	66	19.42	<.01	+2
		TOTAL	616	770			
-F	Sex	a. Male (1)	270	534	37.98	<.01	-2
		b. Female (2)	346	238	52.48	<.01	+2
		TOTAL	616	772			
-G	Disability as Reported	a. Visual Impairment (149)	40	28	5.75	<.05	+1
		b. Hearing Impairment (229)	16	7	5.90	<.05	+1
		c. Lower Limb Impairment from Accident (379)	11	30	5.12	<.05	-1
		d. Arthritis & Rheumatism (390)	1	13	7.85	<.01	-2
		e. Ortho. Impairment due to Accidents (399)	24	61	8.97	<.01	-2
		f. Lower Amputation due to Accident (439)	14	4	8.12	<.01	+2
		g. Psychotic Disorders (500)	20	55	9.54	<.01	-2
		h. Alcoholism (520)	9	29	6.58	<.05	-1
		i. Character, Behavior & Personality Disorders (522)	3	34	19.72	<.01	-2
		j. Nervous System Disorders (639)	5	19	5.39	<.05	-1
		k. Degenerative Heart Disease (642)	0	20	15.97	<.01	-2
		l. Varicose Veins & Hemorrhoids (646)	8	2	5.13	<.05	+1
		m. Emphysema (651)	1	27	18.9	<.01	-2
		n. Other Respiratory (659)	4	20	7.46	<.01	-2
		o. Conditions of Teeth & Supporting Structures (660)	143	36	91.43	<.01	+2
		p. Genito-urinary (670)	25	9	11.7	<.01	+2
		q. Other Disabling Conds. Not Elsewhere Classified (699)	45	35	4.57	<.05	+1
		TOTAL	616	772			

TABLE 3 (con'd)

P-300 Part & Letter	Category	Subcategory	Succ. (26)	Unsucc. (08,28,30)	χ^2 or F	Prob.	Value
-B	SSDI Status at Referral	a. Not applicant (0)	562	464	44.92	<.01	+2
		b. Allowed Benefits (1)	28	112	33.71	<.01	-2
		c. Denied Benefits (2)	16	114	54.16	<.01	-2
		d. Pending Benefits (3)	10	67	30.74	<.01	-2
		e. Not known if applicant (4)	0	12	9.58	<.01	-2
		TOTAL	616	771			
-E	Months in Status 00-02	a. 8 or more months		774	F=101.6	<.01	+2
		b. 3 months or less	540			<.01	+2
-H-1	Major Disability	a. Poliomyelitis (374)	9	1	5.61	<.05	+1
		b. Arthritis & Rheumatism (390)	2	9	5.20	<.05	+1
		c. Ortho. Impairment due to Accident (399)	22	43	9.12	<.01	-2
		d. Lower Amputation due to Accident (439)	14	1	10.01	<.01	+2
		e. Psychotic Disorders (500)	16	42	14.49	<.01	-2
		f. Alcoholism (520)	7	19	6.84	<.01	-2
		g. Character, Personality & Behav. Disorders (522)	10	27	9.65	<.01	-2
		h. Nervous System Disorders (639)	7	18	6.04	<.05	-1
		i. Emphysema (651)	0	16	17.72	<.01	-2
		j. Other Resp. Disorders (659)	4	11	4.02	<.05	-1
		k. Conditions of Teeth & Supporting Structures (660)	136	27	62.34	<.01	+2
		l. Hernia (663)	16	4	6.04	<.05	+1
		m. Genito-urinary (670)	32	9	10.68	<.01	+2
		TOTAL	616	556			
-H-2	Secondary Disab.	a. Visual (1)	52	19	4.38	<.05	+1
		b. Mental (5)	24	5	6.54	<.05	+1
		c. Other Disabling Con. (6)	157	56	14.23	<.01	+2
		d. None (9)	352	303	60.78	<.01	+2
		TOTAL	616	392			
2-I	Previous Closure	a. Yes, closed rehabilitated	49	15	8.08	<.01	+2
		TOTAL	616	427			
2-J	Marital Status	a. Widowed (2)	65	27	4.87	<.05	+1
		b. Divorced (3)	57	23	4.68	<.05	+1
		c. Single (5)	183	172	9.09	<.01	-2
		TOTAL	616	422			

TABLE 3 (cont'd)

R-300 Part & Letter	Category	Subcategory	Succ (26)	Unsucc (08,28,30)	χ^2 or F	Prob.	Value
2-M	Grade	a. less than 9th grade		422	F=4.15	<.05	-1
		b. 9th grade or more	607			<.05	+1
2-N	Work Status	a. Competitive (1)	218	72	27.63	<.01	+2
		b. Other (8)	245	258	27.83	<.01	-2
		TOTAL	615	409			
2-O	Weekly Earnings At Entry	a. $11.73 or less		392	F=19.8	<.01	-2
		b. $21.22 or more	595			<.01	+2
2-P	Total Monthly Family Income	a. $199.00 or less		366	F=9.49	<.01	-2
		b. $200,00 or more	596			<.01	+2
2-Q	Type of Public Assistance	a. Aid to Perm. & Totally Dis. (3)	5	11	5.37	<.05	-1
		TOTAL	586	394			
2-R	Primary Source Of Support	a. Current Earnings (0)	193	62	18.68	<.01	+2
		b. Public Assistance (3)	34	44	8.75	<.01	-2
		c. Institution (5)	23	64	40,83	<.01	-2
		d. Social Security 01	23	30	6.08	<.05	-1
		e. Disability, Old Age, or Unemployment insurance (8)	67	14	17.41	<.01	+2
		TOTAL	602	399			

FOOTNOTE: The expected values for the chi squares were the total proportions closed successfully (26) versus not (08,28,30) when all incomplete (blank) data were discarded.

TABLE 3 SUPPLEMENT A

PREDICTING SUCCESSFUL (STATUS 26) AND UNSUCCESSFUL (STATUS 08,28,30) CLOSURE FROM R-300

EXPANDED CATEGORY OF DISABILITY AS REPORTED

10% Sample FY 69-70

R-300 Part & Letter	Category	Subcategory	Succ. (26)	Unsucc. (08,28,30)	χ^2 or F	Prob.	Value
-G	Disability as Reported	a. 1--, Visual Impairments	52	71	38.47	<<.01	+2
		b. 149, Visual Impairments due to unspec. causes	40	28	8.75	<.05	+1
		c. 22-, Other hearing impairment -causes	24	11	8.36	<.01	+2
		d. 229, Hearing Impairment due to unspec. causes	16	7	5.90	<.05	+1
		e. 3--, Orthopedic Impairment	173	79	62.92	<.01	+2
		f. 34-,35-, Upper Limb ortho impairment	7	25	6.52	<.05	-1
		g. 379, Lower limb impairment due to accident	11	30	5.12	<.05	-1
		h. 38-,39-,Other ortho impairments	30	88	17.03	<.01	-2
		i. 390, Arthritis	1	13	7.85	<.01	-2
		j. 399 Other impairments due to accidents	24	61	8.97	<.01	+2
		k. 43-,Lower limb amputation	16	4	10.33	<.01	+2
		l. 439,Lower limb amputation due to accident	14	4	8.12	<.01	+2
		m. 5--, Mental Disorders	206	83	84.58	<.01	+2
		n. 500, Psychotic Disorders	20	55	9.54	<.01	-2
		o. 52-, Other mental disorders	13	67	25.50	<.01	-2
		p. 520, Alcoholism	9	29	6.58	<.05	-1
		q. 522, Character, Behavior & Personality Disorders	3	34	19.72	<.01	-2
		r. 6--, Other Disabling Conds.	317	330	5.53	<.05	-1
		s. 63-, Other specified disorders of nervous System	13	37	6.78	<.01	-2
		t. 639, Nervous System Disords.	5	19	5.39	<.05	-1
		u. 64-, Cardiac & Circulatory Conditions	29	67	7.72	<.01	-2
		v. 642,Degenerative Heart Dis.	0	20	15.97	<.01	-2
		w. 646,Varicose Veins & Hemorrhoids	8	2	5.13	<.05	+1
		x. 65-,Respiratory Diseases	8	64	32.15	<.01	-2
		y. 651,Emphysema	1	27	18.90	<.01	-2
		z. 659,Other respiratory Dis.	4	20	7.46	<.01	-2
		AA. 66-,Digestive Disorders	182	71	78.31	<.01	+2
		AB. 660,Conditions of teeth & Supporting structures	143	36	91.43	<.01	+2
		AC. 670,Genito-urinary	25	9	11.77	<.01	+2
		AD. 69-,Disabling Conds.(NEC)	48	38	4.61	<.05	+1
		AE. 699,Other Disabling Conds. Not elsewhere classified.	45	35	4.57	<.05	+1
		TOTAL	616	772			

TABLE 3 SUPPLEMENT B

REDICTING SUCCESSFUL (STATUS 26) AND UNSUCCESSFUL (STATUS 08,28,30) CLOSURE FROM R-300
EXPANDED CATEGORY OF MAJOR DISABILITY

P-300 Part & Letter	Category	Subcategory	Succ. (26)	Unsucc. (08,28,30)	χ^2 or F	Prob.	Value
-H-1	Major Disability	a. 1--, Visual Impairments	72	36	8.69	<.01	+2
		b. 11-,Blindness, Both eyes	11	3	3.81	<.05	+1
		c. 2--,Hearing Impairments	32	11	8.27	<.01	+2
		d. 22-,Other Hearing Impairs.	23	7	7.02	<.01	+2
		e. 229,Hearing Impairs. Ill-Defined Causes	13	4	3.90	<.05	+1
		f. 3--,Orthopedic Impairment	81	119	11.54	<.01	-2
		g. 34-,35-,Upper Limb ortho. impairment	7	18	6.02	<.05	-1
		h. 374,Poliomyelitis	9	1	5.61	<.05	+1
		i. 38-,39-,Other or Ill-defined Ortho. impairments	30	58	11.96	<.01	-2
		j. 390, Arthritis & Rheumatism	2	9	5.20	<.05	-1
		k. 399,Orthopedic Impairment due to accident	22	43	9.12	<.01	-2
		l. 4--.Amputation	21	3	11.78	<.01	+2
		m. 43-,Lower limb amputation	16	1	11.79	<.01	+2
		n. 439,Lower limb amputation due to accident	14	1	10.01	<.01	+2
		o. 5--,Mental Disorders	92	155	23.05	<.01	-2
		p. 500,Psychotic Disorders	16	42	14.49	<.01	-2
		q. 52-,Other mental disorders	17	50	19.78	<.01	-2
		r. 520,Alcoholism	7	19	6.84	<.01	-2
		s. 522,Character, Personality Behavior disorders	10	27	9.65	<.01	-2
		t. 6--,Other disabling conds. etiology unknown	318	216	10.64	<.01	+2
		u. 62-,Other specified disorders of nervous syst.	15	31	7.29	<.01	+2
		v. 639,Other nervous system disorders not elsewhere classified	7	18	6.04	<.05	-1
		w. 64-,Cardiac & Circulatory conditions	29	42	3.87	<.05	-1
		x. 65-,Respiratory Diseases	6	37	25.63	<.01	-2
		y. 651,Emphysema	0	16	17.72	<.01	-2
		z. 659,Other Respiratory diseases	4	11	4.02	<.05	-1
		aa. 66-,Digestive System disorders	177	47	63.16	<.01	+2
		ab. 660,Conditions of teeth & supporting structures	136	27	62.34	<.01	+2
		ac. 663,Hernia	16	4	6.04	<.05	+1
		ad. 670,Genito-urinary system disorders	32	9	10.68	<.01	+1
		ae. 999 None	0	16	17.72	<.01	-2
		TOTAL	616	556			

TABLE 4

OF THOSE CLOSED SUCCESSFULLY (STATUS 26), WHICH CASES REQUIRED THE MOST TIME

10% Sample FY 69-70

R-300 Part & Letter	Category	Subcategory	Mean Time In Mos.	N	F Value	Prob.	Value
1-D	Referral Source	a. Educational Institutions (1)	30.9	35		<.01	-2
		b. Hospitals or Sanitoriums (2)	11.2	56		<.05	+1
		c. Health Organizations (3)	20.3	24		<.05	-1
		d. Welfare Agencies (4)	16.3	39		<.05	0
		e. Public Organizations (5)	14.8	68		<.05	0
		f. Private Organizations (6)	9.8	86		<.05	+1
		g. Individuals (7)	10.6	306		<.05	+1
		TOTAL	13.0	614	F=14.9	<.01	
1-E	Age	a. 19 or less	24.7	78		<.01	-2
		b. 20 to 29 years	14.3	134		<.05	-1
		c. 30 to 39 years	10.8	111		<.05	0
		d. 40 to 49 years	10.6	132		<.05	0
		e. 50 to 59 years	10.6	101		<.05	0
		f. Over 60 years	8.1	58		<.05	+1
		TOTAL	13.0	614	F=15.8	<.01	
1-F	Sex	a. Male (1)	15.4	268		<.01	-2
		b. Female (2)	11.1	346		<.01	+2
		TOTAL	13.0	614	F=14.5	<.01	
1-G	Disability as Reported-	a. Visual Impairments (1)	12.8	71		<.05	+1
		b. Hearing Impairments (2)	10.8	32		<.05	+1
		c. Orthopedic Impairments (3)	15.6	79		<.05	0
		d. Amputations (4)	13.5	21		<.05	0
		e. Mental Disorders (5)	20.1	83		<.05	-1
		f. Other Disabling Conds. (6)	10.8	328		<.05	+1
		TOTAL	13.0	614	F=6.7	<.01	
2-H-1	Major Disability	a. Visual Impairments (1)	12.7	72		<.05	0
		b. Hearing Impairments (2)	11.0	32		<.05	0
		c. Orthopedic Impairments (3)	15.3	81		<.05	0
		d. Amputations (4)	13.5	21		<.05	0
		e. Mental Disorders (5)	19.5	92		<.05	-1
		f. Other Disabling Conds. (6)	10.7	316		<.05	+1
		TOTAL	13.0	614	F=6.3	<.01	

TABLE 4 (con't)

R-300 Part & Letter	Category	Subcategory	Mean Time In Mos.	N	F Value	Prob.	Value
2-I	Previous Closure	a. No (1)	13.5	552		<.05	-1
		b. Yes, Rehabilitated (2)	7.5	49		<.05	+1
		c. Yes, Not Rehabilitated (3)	12.5	13		<.05	0
		TOTAL	13.0	614	F=4.11	<.05	
2-J	Marital Status	a. Married (1)	10.3	278		<.05	+1
		b. Widowed (2)	9.8	65		<.05	+1
		c. Divorced (3)	11.5	56		<.05	+1
		d. Separated (4)	9.6	32		<.05	+1
		e. Single (5)	19.3	183		<.05	-1
		TOTAL	13.0	614	F=14.2	<.01	
2-O	Weekly Earnings at Entry	a. No weekly earnings (0)	15.1	357		<.05	-1
		b. $1 to $34 per week (1)	9.2	75		<.05	+1
		c. $35 to $68 per week (2)	9.7	94		<.05	+1
		d. $69 to $99 per week (3)	7.1	47		<.05	+1
		e. $100 or more per week (4)	11.8	20		<.05	0
		TOTAL	12.8	593	F=7.1	<.01	
3-B-2	Rehabilitation Facilities Total Dollars	a. $0 - $100 (1)	12.1	561		<.05	+1
		b. $101 - $500 (2)	14.0	18		<.05	0
		c. $501 - $1000 (3)	23.6	9		<.05	0
		d. $1001 or more (4)	27.5	26		<.05	-1
		TOTAL	13.0	614	F=12.2	<.01	
3-B-3	Social Security Trust Funds Total Dollars	a. $0 - $100 (1)	12.6	606		<.05	+1
		b. $101 - $500 (2)	50.8	4		<.05	-1
		c. $501 - $1000 (3)	24.5	2		<.05	0
		d. $1001 or more (4)	52.0	2		<.05	-1
		TOTAL	13.0	614	F=16.3	<.01	
3-G	Weekly Earnings at Closure	a. No Weekly Earnings (0)	10.9	130		<.05	+1
		b. $1 to $34 per week (1)	11.8	110		<.05	+1
		c. $35 to $68 per week (2)	11.9	184		<.05	+-1
		d. $69 to $99 per week (3)	13.0	98		<.05	+1
		e. $100 or more per week (4)	21.2	71		<.05	-1
		TOTAL	12.97	593	F=7.5	<.01	
3-I	Occupational Code	a. Professional, technical, or managerial (0)	20.8	25		<.05	-1
		b. Professional, technical, or managerial (1)	17.3	20		<.05	0
		c. Clerical or sales (2)	13.4	66		<.05	0

TABLE 4 (con't)

R-300 Part & Letter	Category	Subcategory	Mean Time In Mos.	N	F Value	Prob.	Value
	Occupational Code						
		d. Service occupations (3)	11.5	195		<.05	0
		e. Farming and related (4)	12.7	23		<.05	0
		f. Processing occupations (5)	9.9	131		<.05	+1
		g. Machine Trades (6)	17.4	28		<.05	0
		h. Bench work Occupations (7)	17.8	49		<.05	0
		i. Structured work (8)	14.4	32		<.05	0
		j. Miscellaneous (9)	12.0	44		<.05	0
		TOTAL	12.91	613	F=2.96	<.01	

TABLE 5

OF THOSE CLIENTS CLOSED SUCCESSFULLY (STATUS 26), WHICH CASES REQUIRED THE MOST MONEY

P-300 Part & Letter	Category	Subcategory	Mean Cost in $	N	F	Prob.	Value
-E	Age	a. 19 years or less (1)	$1015.88	79		<.05	-1
		b. 20-29 years (2)	$ 783.29	135		<.05	-1
		c. 30-39 years (3)	$ 415.41	111		<.05	+1
		d. 40-49 years (4)	$ 399.52	132		<.05	+1
		e. 50-59 years (5)	$ 446.63	100		<.05	+1
		f. Over 60 years (6)	$ 471.10	58		<.05	+1
		TOTAL	$ 580.20	615	F=8.44	<.01	
-J	Marital Status	a. Married (1)	$ 448.52	278		<.05	+1
		b. Widowed (2)	$ 404.69	65		<.05	+1
		c. Divorced (3)	$ 577.82	57		<.05	+1
		d. Separated (4)	$ 415.38	32		<.05	+1
		e. Single (5)	$ 872.15	183		<.05	-1
		TOTAL	$ 580.20	615	F=7.97	<.01	
-M	Highest Grade Completed	a. less than 9th grade (1)	$ 473.07	287		<.05	+1
		b. 9th -12th grade (2)	$ 480.00	147		<.05	+1
		c. 12th -15th grade (3)	$ 816.98	174		<.05	-1
		d. College Graduate>16th (4)	$1191.29	7		<.05	-1
		TOTAL	$ 580.20	615	F=7.73	<.01	
-O	Weekly Earnings at Entry	a. No weekly earnings (0)	$ 717.40	359		<.05	-1
		b. $1 - $34 per week (1)	$ 328.27	74		<.05	0
		c. $35 - $68 per week (2)	$ 344.15	94		<.05	+1
		d. $69 - $99 per week (3)	$ 345.43	47		<.05	+1
		e. $100 or more per week (4)	$ 358.75	20		<.05	+1
		TOTAL	$ 568.35	594	F=7.29	<.01	
-G	Weekly Earnings at Closure	a. No weely earnings (0)	$ 525.96	131		<.05	+1
		b. $1 - $34 per week (1)	$ 553.86	109		<.05	+1
		c. $35 - $68 per week (2)	$ 477.08	184		<.05	+1
		d. $69 - $99 per week (3)	$ 582.39	98		<.05	+1
		e. $100 or more per week (4)	$1001.63	71		<.05	-1
		TOTAL	$ 582.20	593	F=4.93	<.01	
J-3	Months in Training Status 18	a. 0 to 6 months (1)	$ 417.78	541		<.05	+1
		b. 7 to 12 months (2)	$1799.38	32		<.05	-1
		c. 13 to 18 months (3)	$1538.20	10		<.05	-1
		d. More than 18 months (4)	$1807.66	32		<.05	-1
		TOTAL	$ 580.20	615	F=69.5	<.01	

TABLE 8 (cont'd)

R-300 Part & Letter	Category	Subcategory	Mean Cost In $	N	F	Prob.	Value
-I	Occupational Code	a. Professional, Technical and Managerial (0)	$ 998.48	25		<.05	0
		b. Professional, Technical and Managerial (1)	$1281.45	20		<.05	-1
		c. Clerical & Sales (2)	$ 694.77	66		<.05	0
		d. Service Occupations (3)	$ 432.86	194		<.05	+1
		e. Farming & Related (4)	$ 295.43	23		<.05	+1
		f. Processing Occupations (5)	$ 541.76	131		<.05	+1
		g. Machine Trades (6)	$ 723.89	28		<.05	0
		h. Bench Work Occupations (7)	$ 724.80	49		<.05	0
		i. Structural Work (8)	$ 680.66	32		<.05	0
		j. Miscellaneous (9)	$ 432.36	44		<.05	+1
		TOTAL	$ 578.78	612	F=3.71	<.01	
3-J-4	Months in Employment Status 20 & 22	a. 0 to 6 months (1)	$ 544.32	528		<.05	+1
		b. 7 to 12 months (2)	$ 856.15	52		<.05	-1
		c. 13 to 18 months (3)	$ 247.17	12		<.05	+1
		d. More than 18 months (4)	$ 953.91	23		<.05	-1
		TOTAL	$ 580.20	615	F=4.07	<.01	

TABLE 6
WHICH CLIENTS SHOWED THE GREATEST REDUCTION IN PUBLIC ASSISTANCE PER MONTH?

10% Sample FY 69-70

P-300 Part & Letter	Category	Subcategory	Mean	N	F Value	Prob.	Value
-D	Referral Source	a. Educational Institution (1)	5.74	54		< .05	-1
		b. Hospitals & Sanitoriums (2)	3.26	114		< .05	-1
		c. Health Organizations & Agencies (3)	4.00	35		< .05	-1
		d. Welfare Agencies (4)	33.0	80		< .05	+1
		e. Public Organizations (5)	4.52	161		< .05	-1
		f. Private Organizations (6)	1.29	17		< .05	-1
		g. Individuals (7)	6.76	522		< .05	-1
		TOTAL	7.87	983	F=7.26	< .01	
1-E	Age	a. 19 or less years	7.70	150		< .05	-1
		b. 20-29 years	4.33	221		< .05	-1
		c. 30-39 years	17.8	176		< .05	+1
		d. 40-49 years	10.7	198		< .05	0
		e. 50-59 years	1.82	160		< .05	-1
		f. 60 or more years	0.91	70		< .05	-1
		TOTAL	7.86	984	F=4.71	< .01	
2-G	Outcome of Referral Process	a. Not Accepted (1)	15.2	299		< .01	+2
		b. Accepted (2)	4.64	685		< .01	-2
		TOTAL	7.86	984	F=17.5	< .01	
2-P	Total Monthly Family Income	a. $0.00-149.99 (0)	6.25	401		< .05	-1
		b. $150.00 - 199.99 (1)	30.2	102		< .05	+1
		c. $200.00 - 249.99 (2)	5.50	103		< .05	-1
		d. $250.00 - 299.99 (3)	7.28	78		< .05	-1
		e. $300.00 - 349.99 (4)	2.78	69		< .05	-1
		f. $350.00 - 399.99 (5)	5.41	32		< .05	-1
		g. $400.00 - 449.99 (6)	0.0	35		< .05	-1
		h. $450.00 - 499.99 (7)	5.63	24		< .05	-1
		i. $500.00 - 599.99 (8)	1.95	38		< .05	-1
		j. $600.00 & over (9)	0.0	40		< .05	-1
		TOTAL	7.81	922	F=5.05	< .01	
2-Q	Type of Public Assistance	a. None (0)	- 1.26	847		<.05	-1
		b. Old Age Assis. (OAA) (1)	31.3	3		<.05	+1
		c. Aid to Blind (AB) (2)	26.0	1		<.00	0
		d. Aid to Perm. Totally Disabled (APTD) (3)	42.4	16		<.05	+1
		e. Aid to Families with Dependent Child (AFDC)(3)	81.8	71		<.05	+1
		f. General Assistance Only (GA) (5)	38.4	19		<.05	+1
		g. AFCE in Combination with Other Type(s) (6)	60.1	8		<.05	0
		h. Any other combination (7)	108.0	5		<.01	+2

TABLE 6 (cont'd)

R-300 Part & Letter	Category	Subcategory	Mean	N	F Value	Prob.	Value
-0	Type of Public Assistance	i. Unknown type(s) (8)	96.0	1		<.05	+1
		TOTAL	7.61	971	F=100.9	<.01	
-R	Source of Support	a. Current Earnings (0)	1.11	249		<.05	-1
		b. Family (1)	.54	395		<.05	-1
		c. Private Relief (2)	0.0	2		<.05	-1
		d. P.A. (3)	78.7	78		<.01	+2
		e. P.A. without Fed. (4)	59.3	15		<.05	+1
		f. Institutional (5)	- 1.01	86		<.05	-1
		g. Workmen's Comp. (6)	0.0	6		<.05	-1
		h. Social Security (7)	1.26	50		<.05	-1
		i. Disab., Old Age, Unemp. (8)	3.19	77		<.05	-1
		j. Private (10)	0.0	6		<.05	-1
		TOTAL	8.02	964	F=58.7	<.01	
3-A	Federal Program Identification	a. None (0)	6.76	912		<.05	-1
		b. SS Disab. Ben. Assigned to Trust Fund (1)	0.83	36		<.05	-1
		c. Armed Forces Rejectee (2)	0.0	2		<.05	-1
		d. Public Offender (20)	0.0	15		<.05	-1
		e. Work Incentive Program (WIN) (40)	119.7	6		<.05	+1
		TOTAL	7.12	971	F=17.3	<.01	
3-E	SSDI Status at Closure	a. Not applicant (0)	3.42	580		<.05	-1
		b. Applicant -Allowed Ben. (1)	3.32	50		<.05	-1
		c. Applicant Denied (2)	10.9	15		<.05	-1
		d. Applicant-Pending (3)	0.0	3		<.05	-1
		e. Not Known (4)	81.0	3		<.05	+1
		TOTAL	3.92	651	F=5.03	<.01	
3-G	Weekly Earnings at Closure	a. No Weekly Earnings (0)	-2.43	203		<.05	-1
		b. $1 to $34 per week (1)	3.52	109		<.05	0
		c. $35 to $68/week (2)	6.79	173		<.05	+1
		d. $69 to $98/week (3)	5.60	95		<.05	0
		e. $99/week or more (4)	4.72	69		<.05	0
		TOTAL	2.96	649	F=2.52	<.05	

TABLE 6 (cont'd)

P-300 Part & Letter	Category	Subcategory	Mean	N	F Value	Prob.	Valu
3-H	Type of Assistance at Closure	a. None (0)	4.16	584		<.05	+1
		b. Old Age Assistance OAA (1)	0.0	1		<.05	0
		c. Aid to Totally Perm. Disabled (3)	-4.33	6		<.05	0
		d. Aid to Families with Dep. Children (AFDC) (4)	-2.28	28		<.05	0
		e. General Assistance (5)	-34.3	6		<.05	-1
		f. AFDC in Combination with Other (6)	-35.0	4		<.05	-1
		g. Any other combination of types (7)	0.0	1		<.05	0
		h. PA Received Between Ref. & Closure (9)	29.3	3		<.05	+1
		TOTAL	3.28	633	F=2.68	<.01	
3-K	Outcome of VR Services	a. Closed From Ext. Eval. 08	15.2	299		<.05	+1
		b. Closed: Rehabilitated 26	4.69	588		<.05	-1
		c. Closed: Not Rehab. 28	2.72	47		<.05	-1
		d. Closed: Not Rehab. 30	5.92	50		<.05	0
		TOTAL	7.86	984	F=5.90	<.01	

TABLE 7
WHICH CLIENTS SHOWED LEAST PUBLIC ASSISTANCE PER MONTH AT CLOSURE?

R-300 Part & Letter	Category	Subcategory	Mean	N	F	Prob.	Valu
1-D	Referral Source	a. Educational Institution (1)	0.28	32		< .05	+1
		b. Hospitals & Sanitoriums (2)	9.52	86		< .05	+1
		c. Health Organizations & Agencies (3)	0.0	20		< .05	+1
		d. Welfare Agencies (4)	39.96	50		< .05	-1
		e. Public Organizations (5)	9.75	75		< .05	+1
		f. Private Organizations (6)	0.0	15		< .05	+1
		g. Individuals (7)	6.16	344		< .05	+1
		TOTAL	9.13	622	F=7.98	< .01	
1-E	Age	a. 19 years or less	.11	82		< .05	+1
		b. 20 to 29 years	6.15	133		< .05	0
		c. 30 to 39 years	16.37	111		< .05	-1
		d. 40 to 49 years	12.74	136		< .06	-1
		e. 50 to 59 years	10.09	110		< .05	0
		f. over 60 years	3.80	50		< .05	0
		TOTAL	9.13	622	F=2.76	< .05	
2-B	SSDI Status at Referral	a. Not applicant (0)	9.25	559		<.05	0
		b. Applicant-allowed (1)	0.0	35		<.05	+1
		c. Applicant-denied (2)	30.93	14		<.05	-1
		d. Applicant-pending (3)	5.43	14		<.05	0
		TOTAL	9.13	622	F=2.63	<.05	
2-J	Marital Status	a. Married (1)	14.63	275		<.05	-1
		b. Widowed (2)	4.93	61		<.05	0
		c. Divorced (3)	2.91	55		<.05	+1
		d. Separated (4)	20.18	33		<.05	-1
		e. Single (5)	2.68	197		<.05	+1
		TOTAL	9.14	621	F=4.87	<.05	
2-O	Type of Assistance At Entry	a. None (0)	1.95	550		<.05	+1
		b. Old Age Assistance (OAA)(1	64.0	1		<.05	0
		c. Aid to Blind (AB) (2)	0.0	1		<.05	+1
		d. Aid to Perm. & Totally Disabled (APTD) (3)	52.0	6		<.05	0
		e. Aid to Families with Dep. Children(AFDC) (4)	81.95	38		<.05	-1
		f. General Assistance Only (GA) (5)	32.44	9		<.05	+1
		g. AFCE in Comb. with other types (6)	88.43	7		<.05	-1
		h. Any other combination (7)	91.0	2		<.05	-1
		i. Unknown type(s) (8)	0.0	1		<.05	+1
		TOTAL	9.19	615	F=49.6	<.01	

TABLE 7 (cont'd)

R-300 Part & Letter	Category	Subcategory	Mean	N	F	Prob.	Value
R	Primary Source of Support	a. Current Earnings (0)	3.41	181		<.05	+1
		b. Family (1)	2.26	246		<.05	+1
		c. Private Relief (2)	0.0	1		<.05	+1
		d. P. A. (3)	98.85	39		<.05	-1
		e. P. A. without Fed. (4)	33.14	7		<.05	+1
		f. Institutional (5)	7.20	51		<.05	+1
		g. Workmen's Comp. (6)	0.0	4		<.05	+1
		h. Social Security (7)	0.0	26		<.05	+1
		i. Disab., Old Age, Unemp. (8)	.93	56		<.05	+1
		j. Private (10)	0.0	4		<.05	+1
		TOTAL	9.23	615	F=53.3	<.01	
-G	Weekly Earnings at Closure	a. No weekly earnings (0)	14.30	193		<.05	-1
		b. $1-$34 per week (1)	10.72	101		<.05	0
		c. $35-$68 per week (2)	6.44	159		<.05	0
		d. $69-$99 per week (3)	0.98	86		<.05	+1
		e. $100 or more per week (4)	4.64	61		<.05	0
		TOTAL	8.72	600	F=2.82	<.05	
-H	Type of Assistance At Closure	a. None (0)	0.12	564		<.01	+2
		b. Old Age Assistance (OAA)(1)	64.0	1		<.05	0
		c. Aid to Perm. & Totally Disabled (APTD) (2)	94.7	6		<.05	-1
		d. Aid to Families with Dep. Children (AFDC) (3)	27.5	28		<.01	-2
		e. General Assistance (GA)(5)	64.8	6		<.05	0
		f. AFDC in comb. with others (6)	167.0	4		<.01	-2
		g. Any other comb. of types (7)	182.0	1		<.01	-2
		h. P.A. received between ref. & Closure (9)	56.0	3		<.05	+1
		TOTAL	9.26	613	F=411.1	<.01	
-L	Services Provided Vocational	a. With cost (1)	0.88	26		<.05	+1
		b. Without cost (2)	58.0	3		<.05	-1
		c. With & Without cost (3)	0.0	3		<.05	+1
		TOTAL	6.16	32	F=23.2	<.01	

TABLE 8
Which Clients Showed Greatest Increase in Weekly Earnings?

R-300 Part & Letter	Category	Subcategory	$Mean	N	F	Prob.	Value
1-E	Age	a. 19 years or less	$26.7	155		<.05	+1
		b. 20 to 29 years	15.0	228		<.05	-1
		c. 30 to 39 years	9.44	178		<.05	-1
		d. 40 to 49 years	8.14	199		<.05	-1
		e. 50 to 59 years	6.51	168		<.05	-1
		f. over 60 years	4.31	72		<.05	-1
		TOTAL	12.3	1000	5.05	<.01	
2-G	Code	a. 00 (1)	- 4.37	8		<.05	0
		b. 02 (2)	-14.0	285		<.05	-1
		c. 04 (3)	15.0	3		<.05	0
		d. 06 (4)	3.16	6		<.05	0
		e. 10 (5)	23.3	698		<.05	+1
		TOTAL	12.3	1000	41.8	<.01	
2-G	Codena	a. Not accepted (1)	-13.7	293		<.01	-2
		b. Accepted (2)	23.1	707		<.01	+2
		TOTAL	12.3	1000	165.6	<.01	
2-H2	Secondary Disability	a. Visual Impairments (1)	10.2	68		<.05	-1
		b. Hearing Impairments (2)	15.1	14		<.05	-1
		c. Orthopedic Impairment (except amputations) (3)	14.6	23		<.05	-1
		d. Absence/Amputation of Major/Minor Members (4)	43.0	3		<.05	0
		e. Mental, Psychoneurotic, & Personality Disorders (5)	46.8	29		<.05	+1
		f. Unknown Etiology (6)	13.0	203		<.05	-1
		g. None (9)	12.0	622		<.05	-1
		TOTAL	13.3	962	3.19	<.01	
2-N	Work Status at Entry	a. No earnings (0)	0.0	2		<.05	0
		b. Competitive (1)	-10.6	285		<.05	-1
		c. Sheltered (2)	42.0	3		<.05	0
		d. Self (3)	- 6.1	13		<.05	-1
		e. State BEP (4)	0.0	1		<.05	0
		f. Homemaker (5)	5.0	121		<.05	0
		g. Unpaid Family (6)	9.0	6		<.05	0
		h. Student (7)	46.8	71		<.05	+1
		i. Other (8)	23.2	485		<.05	0
		j. Trainee (9)	12.5	6		<.05	0
		TOTAL	12.4	993	20.1	<.01	

TABLE 8 (cont'd)

P-300 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
-B2	REH Facilities	a. $100 or less (1)	$10.5	934		<.05	-1
		b. $100 to $500 (2)	17.2	25		<.05	0
		c. $501 to $1000 (3)	35.6	14		<.05	0
		d. $1001 or more (4)	59.1	27		<.05	+1
		TOTAL	12.3	1000	12.3	<.01	
-B3	Social Security Trust Fund	a. $100 or less (1)	11.9	988		<.05	-1
		b. $100 to $500 (2)	24.8	8		<.05	-1
		c. $501 to $1000 (3)	57.5	2		<.05	-1
		d. $1001 or more (4)	114.0	2		<.05	+1
		TOTAL	12.3	1000	4.47	<.01	
-F	Work Status At Closure	a. No Earnings (0)	35.4	5		<.05	0
		b. Competitive (1)	36.8	440		<.05	+1
		c. Sheltered (2)	37.3	8		<.05	+1
		d. Self (3)	17.7	24		<.05	0
		e. State BEP (4)	0.0	1		<.05	0
		f. Homemaker (5)	- 1.9	118		<.05	-1
		g. Unpaid Family (6)	- 2.2	20		<.05	-1
		h. Student (7)	0.0	2		<.05	0
		i. Other (8)	- 5.0	58		<.05	-1
		TOTAL	24.4	676	16.6	<.01	
-I	Occupational Code	a. Professional, Technical, and Managerial (0)	66.4	26		<.01	+2
		b. Professional, Technical, and Managerial (1)	41.3	20		<.01	0
		c. Clerical and sales (2)	41.2	67		<.01	0
		d. Service Occupations (3)	25.8	197		<.01	-1
		e. Farming and Related (4)	25.0	23		<.01	-1
		f. Processing Occupations (5)	1.3	129		<.01	-2
		g. Machine Trades (6)	49.6	28		<.01	0
		h. Bench Work Occupations (7)	18.3	49		<.01	-1
		i. Structural Work (8)	51.4	33		<.01	+1
		j. Miscellaneous (9)	39.1	44		<.01	0
		TOTAL	27.3	616	12.2	<.01	
-J-3	Months in Training (Status 18)	a. 6 months or less (1)	7.8	919		<.01	-1
		b. 7 to 12 months (2)	53.7	34		<.01	+1
		c. 13 to 18 months (3)	47.6	11		<.01	+1
		d. 19 months or more (4)	77.7	36		<.01	+2
		TOTAL	12.3	1000	47.1	<.01	

TABLE 8 (cont'd)

P-300 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
-J-4	Months in Employment (Status 22)	a. 6 months or less (1)	$10.1	909		<.05	-1
		b. 7 to 12 months (2)	38.1	53		<.05	+1
		c. 13 to 18 months (3)	36.8	12		<.05	+1
		d. 19 months or more (4)	26.4	26		<.05	0
		TOTAL	12.3	1000	9.05	<.01	
-K	Outcome of Reh. Services (EXTEV)	a. 08 (1)	-13.7	293		<.05	-1
		b. 26 (2)	27.5	608		<.05	+1
		c. 28 (3)	- 7.4	49		<.05	-1
		d. 30 (4)	- 1.4	50		<.05	-1
		TOTAL	12.3	1000	76.3	<.01	
-K	(EXT CODE)	a. Unable to locate or contact, Moved (1)	- 1.5	24		<.01	-1
		b. Unfavorable medical prognosis (2)	0.2	21		<.01	0
		c. Refused services or further services (3)	- 5.2	21		<.01	-1
		d. Death (4)	-35.9	7		<.01	-2
		e. Client institutionalized (5)	0.0	1		<.01	0
		f. Transferred to another agency (6)	0.0	3		<.01	0
		g. Failure to cooperate (7)	- 2.8	18		<.01	-1
		h. No disabling condition (8)	100.0	1		<.01	+1
		i. No vocational handicap (9)	0.0	1		<.01	0
		TOTAL	- 3.5	97	5.46	<.01	

TABLE 9
Which Clients Showed Greatest Weekly Earnings at Closure?
10% Sample FY69-70

R-300 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
1-D	Referral Source	a. Educational Institutions (1)	$59.4	37		<.01	+2
		b. Hospitals and Sanatoriums (2)	29.3	87		<.01	-2
		c. Health Organizations and Agencies (3)	58.6	22		<.01	+1
		d. Welfare Agencies (4)	37.3	49		<.01	-1
		e. Public Organizations (5)	50.3	81		<.01	0
		f. Private Organization (6)	53.8	16		<.01	0
		g. Individuals (7)	44.0	380		<.01	0
		TOTAL	43.9	672	3.26	<.01	
1-E	Age	a. 19 years or less (1)	63.2	84		<.01	+2
		b. 20 to 29 years (2)	47.0	147		<.01	+1
		c. 30 to 39 years (3)	40.9	122		<.01	+1
		d. 40 to 49 years (4)	46.5	144		<.01	+1
		e. 50 to 59 years (5)	37.8	120		<.01	+1
		f. over 60 years (6)	20.1	55		<.01	-1
		TOTAL	43.9	672	7.17	<.01	
2-H-1	Major Disability	a. Visual Impairments (1)	47.7	67		<.05	+1
		b. Hearing Impairments (2)	59.2	32		<.05	+1
		c. Orthopedic Impairments (3)	48.7	93		<.05	+1
		d. Absence or Amputation (4)	61.3	19		<.05	+1
		e. Mental or Personality Disorder (5)	33.2	128		<.05	-1
		f. Unknown Etiology (6)	43.5	333		<.05	+1
		TOTAL	43.9	672	3.07	<.01	
2-H-2	Secondary Disability	a. Visual Impairments (1)	38.8	59		<.05	-1
		b. Hearing Impairments (2)	27.9	11		<.05	-1
		c. Orthopedic Impairments (3)	38.1	19		<.05	-1
		d. Absence or Amputation (4)	165.0	2		<.05	+1
		e. Mental or Personality Disorders (5)	59.0	26		<.05	-1
		f. Unknown Etiology (6)	40.6	165		<.05	-1
		g. None (9)	45.4	389		<.05	-1
		TOTAL	44.0	671	3.56	<.01	

TABLE 9 (cont'd)

R-200 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
2-J	Marital Status	a. Married (1)	$47.4	296		<.05	+1
		b. Widowed (2)	24.9	69		<.05	-1
		c. Divorced (3)	41.1	59		<.05	+1
		d. Separated (4)	46.1	35		<.05	+1
		e. Single (5)	45.8	213		<.05	+1
		TOTAL	43.9	672	3.70	<.01	
2-L	Number in Family	a. 1	35.3	130		<.05	-1
		b. 2	42.0	124		<.05	0
		c. 3	47.0	143		<.05	0
		d. 4	54.8	89		<.05	0
		e. 5	41.1	72		<.05	0
		f. 6	45.2	41		<.05	0
		g. 7	52.8	28		<.05	0
		h. 8	26.9	17		<.05	-1
		i. 9	35.6	12		<.05	0
		j. 10	43.8	8		<.05	0
		k. 11	61.8	4		<.05	0
		l. 12	100.0	3		<.05	+1
		m. 14	75.0	1		<.05	0
		TOTAL	43.9	672	1.72	<.05	
2-M	Highest Grade Completed	a. less than 9th grade (1)	33.7	313		<.05	-1
		b. 9th to 12th grade (2)	43.3	162		<.05	+1
		c. 12th to 16th grade (3)	60.0	188		<.05	+1
		d. 16th or more (4)	74.1	9		<.05	+1
		TOTAL	43.9	672	15.5	<.01	
2-O	Weekly Earnings at Entry	a. No weekly earnings (0)	35.0	418		<.01	-1
		b. $1 to $34 per week (1)	33.2	74		<.01	-1
		c. $35 to $68 per week (2)	55.8	97		<.01	0
		d. $69 to $99 per week (3)	76.5	50		<.01	+1
		e. $100 or more per week (4)	119.3	20		<.01	+2
		TOTAL	43.6	659	32.1	<.01	

TABLE 9 (cont'd)

R-300 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
2-P	Total Monthly Family Income	a. $0 to $149.99 (0)	$ 32.0	262		<.01	-2
		b. $150 to $199.99 (1)	45.1	68		<.01	-1
		c. $200 to $249.99 (2)	42.1	74		<.01	-1
		d. $250 to $299.99 (3)	54.6	64		<.01	+1
		e. $300 to $349.99 (4)	44.8	54		<.01	-1
		f. $350 to $399.99 (5)	72.2	29		<.01	+2
		g. $400 to $449.99 (6)	59.2	24		<.01	+1
		h. $450 to $499.99 (7)	52.6	18		<.01	0
		i. $500 to $599.99 (8)	65.3	31		<.01	+1
		j. $600 or more (9)	65.8	27		<.01	+1
		TOTAL	44.0	651	5.82	<.01	
2-R	Source of Family Support	a. Current earnings (0)	60.5	196		<.05	0
		b. Family (1)	41.0	263		<.05	0
		c. Private relief (2)	30.0	1		<.05	0
		d. Public Assistance (3)	39.1	36		<.05	0
		e. P.A. without Federal (4)	11.1	7		<.05	-1
		f. Institutional (5)	21.6	54		<.05	-1
		g. Workmen's Comp. (6)	91.7	3		<.05	+1
		h. Social Security (7)	31.3	30		<.05	0
		i. Disability, Old age, Unemployment (8)	28.1	63		<.05	-1
		j. Private (10)	62.8	4		<.05	0
		TOTAL	43.4	657	7.09	<.01	
3-J-3	Months in Training (Status 18)	a. 6 months or less (1)	40.7	593		<.05	-1
		b. 7 to 12 months (2)	56.4	34		<.05	-1
		c. 13 to 18 months (3)	49.9	11		<.05	-1
		d. 19 months or more (4)	85.2	34		<.05	+1
		TOTAL	43.9	672	11.9	<.01	
3-B-2	Rehabilitation Facilities Total $	a. $100 or less (1)	43.1	614		<.05	-1
		b. $100 to $500 (2)	34.1	23		<.05	-1
		c. $501 to $1000 (3)	58.4	10		<.05	0
		d. $1001 or more (4)	67.5	25		<.05	+1
		TOTAL	43.9	672	3.06	<.05	

TABLE 9 (cont'd)

P-300 Part & Letter	Category	Subcategory	$ Mean	N	F	Prob.	Value
3-F	Work Status at Closure	a. No Earnings (0)	$ 57.0	5		<.05	0
		b. Competitive (1)	64.6	436		<.05	+1
		c. Sheltered (2)	46.9	8		<.05	0
		d. Self (3)	29.6	21		<.05	-1
		e. State BEP (4)	40.0	1		<.05	0
		f. Homemaker (5)	0.4	114		<.05	-1
		g. Unpaid family (6)	0.0	15		<.05	-1
		h. Student (7)	0.0	2		<.05	-1
		i. Other (8)	0.0	56		<.05	-1
		TOTAL	44.8	659	55.6	<.01	
3-I	Occupation Code	a. Professional, technical, & managerial (0)	106.8	26		<.01	+2
		b. Professional, technical, & managerial (1)	78.9	20		<.01	+1
		c. Clerical and sales (2)	70.4	66		<.01	+1
		d. Service Occupations (3)	45.5	196		<.01	-1
		e. Farming and related (4)	42.2	20		<.01	-1
		f. Processing Occupations (5)	6.3	125		<.01	-2
		g. Machine trades (6)	70.4	28		<.01	+1
		h. Bench Work Occupations (7)	37.0	44		<.01	-1
		i. Structural Work (8)	78.8	32		<.01	+1
		j. Miscellaneous (9)	85.9	44		<.01	+1
		TOTAL	49.0	601	41.4	<.01	

Postscript

In the course of these analyses several additional suggested items emerged that would be helpful for practical program evaluation. The following may not currently be recovered from the RSA-300, but could be objectively measured and recorded with little additional counselor effort. Such items might be included on a revised RSA-300 form.

A. Information source in self referrals.

B. Client-counselor contact hours.

C. Total hours (all services) for a given client.

D. A case difficulty indication (so that % of severely disabled, creaming, etc. could be determined).

E. Follow-up information.

DRAFT

MEASUREMENT OF CLIENT OUTCOMES IN REHABILITATION[1]

Richard T. Walls and M. S. Tseng
West Virginia University
Rehabilitation Research and Training Center RT-15

I. A PARADIGM OF THE REHABILITATION SYSTEM

A. Conceptual Framework

In order to maintain a proper perspective while dealing with the issues of measuring client outcomes in rehabilitation, the rehabilitation system will be viewed in this chapter as an input-intervention-output paradigm (see Figure 1). A paradigm is conceived as a model or pattern that portrays the temporal, spacial, causal, or logical relationships of events by boxes, connecting lines, and positions on vertical and horizontal dimensions. The primary reason for conceptualizing an input-intervention-output paradigm of rehabilitation is that more systematic, orderly, and useful approaches to the identification and assessment of issues involved in the measurement of client outcomes can be attempted.

Insert Figure 1 about here

As can be seen in Figure 1, this paradigm of the rehabilitation system assumes three basic stages, input, intervention, and output which complete a looping cycle. Included in the "input" end are the components of (1) general population, (2) a sub-population consisting of people who need rehabilitation, and (3) another sub-population of those who serve as rehabilitation resources.

The second stage, "intervention", represents a phase during which rehabilitation takes place. The disabled person may complete this state (1) entirely on his own resources, (2) through the assistance of public and private agencies other than those of vocational rehabilitation, or (3) via the services of vocational rehabilitation agencies. The primary role of the vocational rehabilitation agencies is portrayed in Figure 1 by the largest box (formed by broken lines) in which diagnostic and evaluation, counseling and guidance, physical restoration, training, placement, and follow-up services are to serve as vehicles for intensive client-rehabilitation agent interactions. The client comes into this box bringing with him his physical, psychological, educational, social, and occupational strengths and weaknesses. The rehabilitation agent who is to help the client, also brings his background and personal attributes into the picture. Interactions between the client and the rehabilitation agent through various services allow pooling of the client's own resources and the environmental resources to facilitate his rehabilitation.

The client then moves on to the "output" stage where ideally his dependency is lower, self care improved, self support attained or retained, and family life strengthened (taken from the SRS program objectives, 1968). The client then reenters the general population. From a strictly client-centered perspective, this input-intervention-output paradigm may be viewed as a rehabilitation intake-process-outcome model where rehabilitation intake, rehabilitation process, and rehabilitation outcome constitute rehabilitation input, intervention, and output, respectively.

To illustrate how the client goes through the rehabilitation process (or intervention) stage with the assistance of the state vocational rehabilitation agency within the paradigm, Figure 2 is presented. Notice that this flow chart (Leary & Tseng, 1974) makes use of the rehabilitation statuses (00-30) which are currently in use by vocational rehabilitation agencies across the nation. Every two digit number in the chart represents a rehabilitation status which identifies a particular phase in the rehabilitation system.

Insert Figure 2 about here

The first status at which the client enters the intervention (or process) stage is 00 (REFERRAL). A client is a referral once the agency records his name, address, disability, age, sex, date of referral, source of referral, and social security number.

When the client indicates that he would like to work with vocational rehabilitation and signs the application he moves to status 02 (APPLICANT).

It is sometimes necessary to determine eligibility for services. He goes to status 06 when extended evaluation up to 18 months is needed. The 04 status has recently been deleted.

If the client is not eligible for rehabilitation services, or eligibility cannot be determined, the case is closed at status 08.

He, therefore, goes back, through the exit point 08, to the general population in the "input" stage of the paradigm.

The client moves to status 10 if he is eligible for rehabilitation services and a rehabilitation plan is being prepared. He goes on to status 12 when the rehabilitation plan is approved.

For some reason, a case may have to be closed from statuses 10 or 12. He leaves the "intervention" stage, as far as the vocational rehabilitation agency is concerned at this point, through status 30.

The client moves on to status 14 when receiving counseling and guidance, to status 16 while receiving physical restoration service, or to status 18 when he is being educated or trained.

After all necessary services have been provided, the client is ready for employment. He is in status 20 if he does not return to or obtain employment immediately. He goes to status 22 if he obtains employment or returns to former employment.

At times, the client's services can be interrupted. He moves to status 24 and remains there during the period of service interruption.

When the client has been provided with the services that were planned for him and has reached the point in his rehabilitation process where he cannot be additionally assisted by the agency, his case is closed. If the client is not employed and the case is closed, he moves to the "output" stage of the paradigm through status 28. On the other hand, when the client is productively employed and the case is closed, he moves out of the system through status 26 and enters the "output" stage of the paradigm.

It is clear from the above description that clients who enter this vocational rehabilitation system are to move out of it after intervention through four exits, or outcome statuses. They are statuses 08, 30, 28, and 26.

While status 08 signifies the rejection of referred cases for services, statuses 30, 28, and 26 provide exits for those referred cases accepted for services.

Of the cases accepted for services, those who have received some assistance and are closed unemployed are routed to status 30 which signifies unsuccessful closure, those who have received all necessary services and are closed unemployed are branched to status 28 which indicates another unsuccessful closure, and those who have received all necessary services and are employed do reach the desired exit point status 26 which represents a successful closure. The various categories of employment induced within the status 26 rehabilitation and their associated interpretation difficulties are discussed later in this chapter.

Obviously, rehabilitation intervention (or process) should have positive impact not only on the client employability but also on a host of other aspects of this individual's functioning, including his occupational, physical, economic, educational, social, and psychological well-being. Any specific attributes in these different dimensions which are operationally defined to yield valid and reliable measures can be used as criteria of success for assessing the effectiveness of rehabilitation intervention (or process).

How do we determine the effect of rehabilitation intervention (or process) on, say, client attribute A, which has been operationally defined, using the input-intervention-output (or intake-process-outcome) paradigm? Table 1 shows a general configuration, known as the one-group pretest-posttest design (Campbell and Stanley, 1963), with which the effect of intervention may be investigated.

Insert Table 1 about here

Notice that "X" in the table indicates the presence of intervention during the rehabilitation process phase and "Os" represent observations of a specific criterion attribute, in our example client attribute A, conducted for a given group of clients. O_1 denotes observation made at the intake (or input) point which yields a quantitative measure for each client. This pre measure constitutes a baseline for the individual as far as the attribute A is concerned. O_2 indicates observation made immediately after intervention. This yields a post measure of attribute A for each client.

With the pre and post measures taken, we can thus determine the change that occurred in criterion A ($O_2 - O_1$) and attribute it to intervention (X). In a real sense we are using each individual client as his own control in this particular design.

However, from purely experimental view point the one-group design has certain built-in imperfections. For instance, how do we know that extreneous variables, that is variables other than the rehabilitation intervention (X), did not influence the post measure (O_2) and, therefore, the change in criterion ($O_2 - O_1$)? Maybe without rehabilitation intervention a change could take place in the criterion over an equivalent period of time. We are saying that part of $O_2 - O_1$ (criterion change) may be due to the effect of factors other than X (intervention).

Whenever we address ourselves to this question: "To what extent can we attribute $O_2 - O_1$ to X?", we are concerned with the so called internal validity of an experimental design. The one-group pretest-posttest design does not provide the mechanism necessary for sorting out that amount of criterion change due to factors other than intervention, and because of this, its internal validity suffers (for in-depth discussion on issues concerning the internal validity of an experiment readers are referred to the work of Campbell and Stanley, 1963).

In order to account for the amount of criterion change ($O_2 - O_1$) that might be due to factors other than rehabilitation intervention (X) and, therefore, increase the internal validity, one may want to consider another design which is shown in Table 2.

Insert Table 2 about here

This time we are applying what is known as the pretest-posttest control group design to our rehabilitation intake-process-outcome paradigm. Notice that there are two equivalent groups of clients in this design.

Clients in the first group, as represented by the first row in Table 2, are to be pre-observed (denoted by O_{11} with the first subscript representing Group 1 and the second subscript Time 1 at the intake) as to an operationally defined client attribute A, subjected to rehabilitation intervention (denoted by X). Post observation (denoted by O_{12} with the first subscript standing for Group 1 and the second subscript Time 2 immediately after intervention) as to the same criterion (client attribute A) then follows.

Clients in the second group, represented by the second row in Table 2, are to be *pre-observed* (denoted by O_{21} with the first subscript representing Group 2 and the second subscript Time 1 at intake) in terms of the same criterion (client attribute A), receiving *no rehabilitation intervention* (denoted by a blank, or non-X). They are then *post-observed* (denoted by O_{22} with the first subscript standing for Group 2 and the second subscript Time 2 immediately after an equivalent period of non-intervention) on the same criterion.

In essence, Group 1 in Table 2 is the experimental group which allows us to attribute $O_{12} - O_{11}$ (change in criterion measures for the experimental group) to the *presence of X* (rehabilitation intervention). Group 2 is the control group which enables us to attribute $O_{22} - O_{21}$ (change in criterion measures for the control group) to the *absence of X* (no rehabilitation intervention). Sorting out the effect of the absence of X from that of the presence of X would give us the net gain due to X (rehabilitation intervention). Therefore, $(O_{12} - O_{11}) - (O_{22} - O_{21})$ represents the net gain attributable to rehabilitation intervention using the pretest-posttest control group design as shown in Table 2 where the two groups (one experimental and one control) are equivalent.

We have just examined two specific designs that do fit nicely within the framework of the rehabilitation input-intervention-output paradigm. There are, of course, more designs of experimental and quasi-experimental types that are available and should be considered.

At any rate, the input-intervention-output paradigm of rehabilitation does provide a comprehensive conceptual framework with which issues in rehabilitation including those on the measurement of client outcomes can be systematically and orderly investigated.

B. Rehabilitation Agency Outcome Criteria

The standard RSA-300 Case Service Report form is currently used by Vocational Rehabilitation "to summarize the statistical data necessary to describe the various aspects of the program, to provide an adequate basis for sound planning, and to provide a minimum amount of uniform case progress information (NCSS Statistical Manual, 1971, p. VI-E-1)." This one page report form which is to be filled out by the rehabilitation counselor for each individual client is reproduced in Figure 3. All individuals classified as referrals must be recorded and reported by this form. It includes basic intake or referral information and follows the client from referral to case closure as was illustrated in Figure 2 (Flow Diagram).

Insert Figure 3 about here

As noted, there are only four points of exit from the rehabilitation system, Status 08, Status 26, Status 28, and Status 30. These outcome statuses are defined more specifically below.

The 08 status identifies all persons not accepted for vocational rehabilitation services. This includes individuals who (1) are referred to the agency by letter, telephone, or other means (00) but for one reason or another never apply for services (08); (2) apply for services (02) but are determined inelligible (08) through evaluation (06). The six steps to Status 26, "closed rehabilitated", are (1) have been declared eligible, (2) have received appropriate diagnostic and related services, (3) have had a plan for vocational rehabilitation services formulated, (4) have completed the plan insofar as possible, (5) have been provided counseling as an essential rehabilitation service, and (6) have been determined to be suitably employed for a minimum of 30 days. If a client achieves (1) and (2) above but drops out, dies, moves away, or for some reason does not begin (3), he exits as Status 30, "closed other reasons before rehabilitation plan initiated." However, if (1) and (2) above are completed and (3) has begun, but for some reason one or more of the other three criteria, (4), (5), or (6), were not met, he is "closed other reasons after rehabilitation plan initiated" in Status 28 (NCSS Statistical Manual, 1971).

A careful examination of the RSA-300 Case Service Report form (Figure 3) reveals that there are two different types of outcome variables that are routinely tapped. One type yields only the post-data, and another type provides both the pre- and post-measures.

Statuses 08, 26, 28, and 30 constitute an outcome variable which belongs to the first type. As it is defined by the four exit statuses, this outcome variable does not need any pre-measures in order to account for the effect of rehabilitation intervention. Since it yields frequency data, several indices may be developed to assess the efficiency of the vocational rehabilitation system as follows (assuming that a particular population or a sample of clients served during a given fiscal year is involved): (1) The probability for a client to be rejected for vocational rehabilitation services is given by 08's/(08's + 26's + 28's + 30's), we may call this the rejection ratio. (2) The probability for a client to be accepted for vocational rehabilitation services is expressed by 1 - 08's/(08's + 26's + 28's + 30's) or by (26's + 28's + 30's)/(08's + 26's + 28's + 30's), we may call this the acceptance ratio. (3) The probability for a client who is accepted for services to be successfully rehabilitated can be represented by 26's/(26's + 28's + 30's), we may name this the rehabilitation success ratio. (4) The probability for a client who is accepted for services to be unsuccessfully rehabilitated is 1 - 26's/(26's + 28's + 30's) or (28's + 30's)/(26's + 28's + 30's), we may call this the rehabilitation failure ratio. (5) The probability for a client who has received all necessary services to be successfully placed is expressed by 26's/(26's + 28's), this may be named as the placement success ratio. (6) The probability for a client who has received all necessary services to be unsuccessfully placed is given by 1 - 26's/(26's + 28's) or by 28's/(26's + 28's), we can call this the placement failure ratio.

The second type of outcome variables which yields both pre- and post-measures includes (a) work status, (b) weekly earnings, (c) public assistance type, and (d) public assistance monthly amount. Change occurring in each of these four outcome criteria as represented by the difference between referral (or pre) data and closure (or post) data can now be attributed to rehabilitation intervention. This can be accomplished by using either one-group design without a control (as shown in Table 1) or two-group design with a control (as described in Table 2).

Criterion variable "work status" consists of nine levels and yields frequency (discrete) data. The nine categories of this criterion are (1) competitive labor market, (2) sheltered workshop, (3) self-employed (except BEP), (4) state agency-managed business enterprises (BEP), (5) homemaker, (6) unpaid family worker, (7) student, (8) other, and (9) non-competitive labor market, trainee, or worker. The pre (or referral) and post (or closure) data on work status are recorded in Part 2-N and Part 3-F respectively, of the Case Service Report RSA-300 (see Figure 3).

Criterion "weekly earnings" is a continuous (nondiscrete) variable yielding measurement (or metric) data. The referral (or pre) and closure (or post) data are found in Part 2-O and Part 3-G, respectively, of the Case Service Report, RSA-300.

Criterion "public assistance type" is a nominal variable consisting of ten categories and yielding frequency data. The ten categories are (0) none, (1) Old-Age Assistance (OAA), (2) Aid to the Blind (AB), (3) Aid to the Permanently and Totally Disabled (APTD), (4) Aid to Families with Dependent Children only (AFDC), (5) General Assistance only (GA), (6) AFDC in combination with other type(s), (7) any other combination of above types, (8) type(s) not known, (9) PA received between referral and closure only. The pre- and post-data are recorded in Part 2-Q and Part 3-H respectively, of the Case Service Report RSA-300.

Finally, criterion "public assistance monthly amount" is a continuous variable yielding metric data. The referral and closure data on this variable are recorded in Part 2-Q and Part 3-H respectively, of the Case Service Report RSA-300.

The above outcome criteria are those routinely handled quantitatively by vocational rehabilitation agencies through the Form RSA-300 (Case Service Report). They do fit in the input-intervention-output (or intake-process-outcome) paradigm and provide readily available data for the assessment of client outcomes in rehabilitation.

II. REVIEW OF OUTCOME VARIABLES

The broad mission of the Rehabilitation Services Administration (RSA) has been stated as "In conjunction with other public and voluntary agencies, to stimulate, develop, and implement programs which provide services for the disabled in maximizing their potential for a full and, to the extent possible, a productive life (RSA Long-Range Plan, 1973)." A full and productive life is of course subject to varying interpretation.

Productivity in terms of raw numbers of rehabilitants is obviously an agency program goal. They propose to increase this gross number of rehabilitations to 400,000 in 1975 and to 680,000 in 1979. This pure quantity measure of outcome refers to the total number of "Status 26 Closures."

Vocational Rehabilitation has traditionally operated within this "numbers" framework and has been widely accused of "creaming off the top" or taking the easier cases. There is a natural inclination for state and local programs to spread limited resources to help the most people and to appear favorably in statistics required by the Agency.

Although RSA admonitions for increasing quality as well as quantity have become a tradition with little substance, there is increasing evidence of genuine concern for developing outcome criteria to more adequately represent client accomplishment. This increased concern emerges as vocational rehabilitation begins to reach more deeply into areas of the severely disabled.

The primary concern for improving outcome in terms of earning levels and employment stability is apparent in the sub goals listed by RSA. Services should, ". . . lead to full or partial participation in the labor force . . . to the extent individually possible, become productive in the economy." However, such other outcomes are enumerated as reduction of the institutionalized population and their dependency on society (RSA Long-Range Plan, 1973).

Additional evidence of active agency pursuit of alternatives and supplements to absolute number of successful case closures comes from the considerable research projects, programs, and centers supported by The Social and Rehabilitation Services. RSA also recognizes the need for viable outcome alternatives to the 26 closure status system and encourages research in general, as well as suggesting directions for specifically needed research.

General criticisms and resentment of the closure system and the "numbers game" have been growing steadily in rehabilitation for more than two decades. Viaille (1968) contended that the agency closure reporting system encourages (1) number of closures rather than quality of services, (2) noncomplex cases requiring least counselor time, (3) premature case closure to meet quotas, (4) seasonal demand and uneven case flow, (5) distortion and questionable practices in reporting, because of special cases, etc., (6) no recognition for effort expended in cases closed nonrehabilitated. Similar objections have been noted by other authors (Hawryluk, 1972; Muthard & Miller, 1966; Silver, 1969; Westerheide & Lenhart, 1974).

Present and past attempts to develop weighted closure systems have been seriously damaged by the inadequate closure classifications used as outcome measures. Prerequisite to weighted closure is establishment of clear, unequivocal, operational, outcome variables. Such research makes the prominent error of assuming homogeneous groups exist with regard to both outcome and prediction variables. The typical effort attempts to relate various client factors to the gross agency status outcomes through correlational (correlational, regression, factor analysis) techniques.

It is thus justifiably imperative that high priority be given to development of accurate and more objectively descriptive outcome criteria for rehabilitation. To date, however, an alternative accountability scheme, acceptable to all concerned, has not emerged. The gross concept of the "26 closed rehabilitated" remains. Even such a macro criterion is preferable to no criterion at all.

With such difficulties noted, the following work is presented to provided a context for further discussion and model explication. The great majority of research has utilized closed-rehabilitated versus not rehabilitated as the criterion. However, a few investigators have attempted creative departures to other outcome variables.

A. Studies with a "Closed Rehabilitated" Criterion

The present discussion is not intended as a descriptive or integrative literature review. Several good reviews of success prediction and client characteristics associated with outcome are extant (Day, Cummings, Anderson, & Iverson, 1969; Grigg, Holtmann, & Martin, 1970; Hammond, Wright, & Butler, 1968; Sankovsky, 1968). Rather, the intent here is to summarize briefly the criterion variables used in such studies. As noted, the vast majority have utilized 26 Status (closed rehabilitated) as the success criterion.

Some potential prediction variables are continuous in nature and may be considered at least ordinal. That is, the order of two data bits may be specified by treating one as greater than the other. Variables such as age at disablement and years of education approach the equal-appearing interval or even a true interval scale with a true zero point. Such scales are considered additive and are appropriate for use in analysis of variance, product-moment correlation and similar statistical models discussed subsequently. Some variables are clearly noncontinuous. Examples are marital status and sex. Of course, a continuous variable such as age may be split into below age 30 and above age 30 or some such partition, to create discrete categories. A success versus nonsuccess criterion is also obviously noncontinuous or discrete. Although reader sophistication in statistical concepts is by no means required, the noted distinction between noncontinuous (nominal or discrete) and ostensibly continuous variables is helpful to be advised of as the discussion continues.

Demographic variables have been the most available data across large numbers of clients. Further, demographic characteristics are in large part relatively objective and have thus been used in a number of research efforts. In one study or another, depending on the local sample or population studied, the scale or split utilized, and the statistical technique employed, all of the following have been found related to successful closure-rehabilitated. The list as reported here is in no way instructive to the reader who wishes to know which level or end of a scale is predictive of success in rehabilitation. It simply indicates that a lot of demography has been found related to the present closure status system. Some variables identified have been: major disability, age, age at disability onset, marital status, number of dependents, education, race, referral source, SSDI status, public assistance, source of income, mobility, socioeconomic status, employment history, home ownership, sociocultural disadvantagement (Aiduk & Longmeyer, 1972; DeMann, 1963; Heilbrun & Jordan, 1968; Miller & Allen, 1966; Tosi & Vesotsky, 1970; Westerheide & Lenhart, 1974).

Less readily available is information of a social and psychological nature. Several studies have attempted to use such factors in predicting successful rehabilitation closure. The MMPI, Army General Classification Test, Rorschach, Kuder Personal Preference Record, and Wechsler Adult Intelligence Scale have been used as predictors with little success

(Ayer, Thoreson, & Butler, 1966; Drasgow & Dreher, 1965; Gilbert & Lester, 1970; Goss, 1968; Gressett, 1969; Neff, 1955; Pearlman & Hylbert, 1969). Social Vocabulary Index, the Interaction Scale, the Edwards Personal Preference Schedule (Clayton, 1970; Goss, Morosko, & Sheldon, 1968; MacGuffie, 1970; MacGuffie, Janzen, Samuelson, & McPhee, 1969) have also yielded marginal success. It appears that more acceptable psychological adjustment and health as well as mental agility may be associated with successful closure and placement. However, such general and weak relationships from psychological tests probably contribute minimally to increased understanding or prediction.

A few investigators have also attempted to study social or psychosocial constructs releted to client outcome (Barry & Malinovsky, 1963; Lane & Barry, 1970; Salomone, 1972; Westerheide & Lenhart, 1974; Wright, 1968). For example, social and religious participation, family relationships, motivation, vocational goals, personal characteristics, and employer attitudes toward physical impairment have been discussed as possible predictors. The operational definitions of motivation, for example, are often too broad or variable to facilitate measurement, interpretation, or communication. In short, ego strength and similar social-psychological attitude constructs in the absence of defining and vocationally relevant behaviors appear to hold little promise of reliable aid in prediction of rehabilitation outcome as it presently exists.

Bolton (1972) suggests that although prediction of outcome studies have been popular, the single greatest need in such research is standardization of research procedures and uniformity of reporting format.

Bolton states, "Prediction studies in rehabilitation are generally not comparable due to mixed disability samples and differences in referral criteria, criterion definitions and measurements, predictor variables (even biographical data is not comparable because every agency collects slightly different information or records it differently) and methods of data analysis (p. 17)."

Case difficulty ratings have also been primarily based upon the 08, 26, 28, 30 closure criterion. Muthard (1965) stated:

> . . . it seems reasonable to assume that fewer difficult and complex cases result in . . . closures (successful). In fact, an operational definition of case difficulty and complexity could be the number of cases -- of all like these -- which achieved rehabilitation status. Thus, the question of building a set of complexity weights, or 'norming' case difficulty, becomes one of figuring out what variables within cases make a difference in terms of later success. We can then build sub-populations of 'cases-like-this' to see what percentage of each sub-population is achieving . . . closure (successful) status. On the basis of these percentages, we can then 'norm' the cases for complexity (p. 31).

Both Miller and Barillas (1967) and Wallis and Bozarth (1971) utilized this general approach. The former system considered major disability, referral source, age, and years of education -- with closure status as the outcome. Wallis and Bozarth (1971) used major disability, age, years of education, and type of previous rehabilitation contact -- also with a successful closure criterion.

Sermon (1972) developed a case difficulty index from the percent rehabilitated nationally for any given disability-category. This plan uses the previous year's national statistics to establish the difficulty associated with each disability while disregarding other qualifying demographic, psychological, or social characteristics. Obviously the criterion is the agency rehabilitation, successful versus unsuccessful closure. Several states (e.g. Florida) are experimenting with or incorporating the difficulty index into their data procedures. Florida uses a Composite Difficulty Index that includes (1) time (2) cost (3) number of services provided and (4) Sermon's index (Zawada, 1973). Zawada reports this composite index to be valuable for program evaluation studies in Florida.

In a study relating case service expenditures to the number of successful closures per counselor, Lawlis and Bozarth (1971) attempted to differentiate quantity from quality. They proposed that increased quantity or number of successful 26 closures is associated with more funds spent on a larger number of client[illegible]n the latter circumstance more complex cases are assumed to require greater appropriations. Possible sources of inaccuracy in such assumptions have been noted (Westerheide & Lenhart, 1974).

B. Studies with "Other" Criterion Variables

Several departures from the 26 closed-rehabilitated criterion have been attempted. Silver (1969) obtained counselor estimates of difficulty of rehabilitating various disabilities in terms of counselor time and effort. Paired comparison and semantic differential techniques were used in an attempt to rank order gross disability categories in time and effort judged by counselors to be necessary to gain successful closure. Although Silver obtained fairly consistent ordering from cerebral palsy (most difficult) through hernia and dental repair, such measures contribute little to objective case outcome study. In fact the judgements are made in reference to standard closure criteria. Similarly, a difficulty index taking account of total time from client acceptance to closure has the same terminal reference. Goff (1969) computed difficulty in terms of months from acceptance to closure, but of course counts the agency closure status as the end point in the process.

In addition to their previously noted criterion, Miller and Barillas (1967) unsuccessfully attempted to relate their index to a measure of client satisfaction. Kunce, Mahoney, Campbell, and Finley (1969) reported a significant relationship between treatment time and job level, but none between treatment time and job placement or salary. Utilizing variables from the RSA-300 having a common sense contribution to gainful employment, Kunce and Miller (1972) sought relationships to three outcome criteria. The 12 predictor variables were age, selective service, race, number of dependents, years of education, earnings at acceptance, welfare status, SSDI status, number of disabilities, marital status, and previous rehabilitation client. The three criterion variables were closure status, work status at closure, and earnings at closure. Those authors report a number of significant chi square, correlation, and stepwise regression findings in relation to these three outcome metrics (Westerheide & Lenhart, 1974).

Eber (1966) derived two criterion measures from closure and follow-up information. "Vocational Adequacy at Closure" involved differential weights for (1) work status at closure, (2) DOT job code at closure, (3) weekly earnings at closure, and (4) closure code. His "Vocational Adequacy at Follow-up", similarly involved (1) employment at follow-up, (2) work status improvement from closure, (3) job satisfaction, and (4) counselor estimate of success. An 11 step composite work adjustment criterion was used in a follow-up study of former VA clients by Stein, Bradley, and Buegel (1970). These 11 brief descriptions of work adjustment provided indication of (1) current job status, (2) job time, and (3) number of jobs since discharge (Bolton, 1974). However, as with other novel outcome criteria these have been used by few researchers or agencies except those developers.

The Regional Rehabilitation Research Institute (RRRI) at Oklahoma University constructed items designed to measure client satisfaction with speed of service, medical service, training service, employment, participation in planning, counselor effort in placement, agency policies, physical facilities, and personal treatment in the Consumer's Measurement of Vocational Rehabilitation (Hills & Ledgerwood, 1972). While such follow-up attempts are laudable, their percent of questionnaire return has been low (13% and 27%). Further, the unreliability of such judgmental items as, "The quality of training I received" and "My counselor's ability to help me" may preclude the usefulness of these responses.

In addition to closure status, Ayer, Thoreson, and Butler (1966) used DOT occupational level and an upward mobility rating as outcomes.

McPhee and Magleby (1960) used substantial, unsubstantial, and minimal employment. One criterion variable for Neff, Novick, & Stern (1968) was percent of time worked during a one year follow-up period. Tseng (1972) found a number of personal and skill characteristics related to successful versus unsuccessful completion of vocational training. Rehabilitation success was in terms of ambulation and self care skills for Ben-Yishay, Gertsman, Diller, and Hans (1970). Several employment related criteria (level, persistance, tenure, stability, looking for work, employer/employee satisfaction, have been examined in relation to various handicaps (Barry, Dunteman, & Webb, 1968; Kilburn, & Sanderson, 1966; Miller, Kunce, & Getsinger, 1972; Schletzer, Dawis, England, & Lofquist, 1959; Weiner, 1964). For sheltered workshop clients Nadler (1957) used a composite criterion of (1) number of jobs client could perform. (2) his productivity, (3) his steadiness of work, (4) attendance and punctuality, (5) independence, and (6) work quality. Cunningham, Botwinik, and Weickert (1969), Taylor (1963), Lowe (1967) and Lorei (1967) considered remaining out of the hospital and in the community a success criterion for mental patients, while Burstein, Soloff, Gillespie, & Haase (1967) considered discharge and employment outcome for a similar sample. Noble (1973) suggests the current U. S. minimum wage as the success closure criterion.

Many authors and professionals are presently suggesting that a measure of client improvement or change from beginning to end of the rehabilitation process is the most profitable outcome consideration. The agency closure criterion or economic indicators are surely inadequate for reflecting accomplishments of an unpaid family worker or homemakers.

However, it is these very economic and vocational changes that are most readily measured, e.g., increase in weekly earnings, reduction in welfare grants, job level. Valid physical and psychological improvements are more difficult, but probably not impossible to measure reliably. Several suggestions for incorporating such change factors, (i.e., social, community, and personal living competencies) in outcome metrics have been broached (Cook, 1967; Kelman & Willner, 1962; Krantz, 1971). The States Advisory Committee for Service Outcome Measurement Project (RSA/EV-3-73) listed criteria for administratively feasible change outcomes as (1) being measured for all clients, (2) requiring no changes in service delivery systems, (3) requiring no sophisticated data processing equipment, (4) being easily interpreted, (5) requiring little training, and (6) not requiring more than 10 minutes of counselor time per case. While researchers should attend to such administrative requests for parsimony, the development of suitable rehabilitation outcomes should be the overriding consideration at this point.

A Rehabilitation Gain Scale was constructed by Reagles, Wright, and Butler (1970) (University of Wisconsin Regional Rehabilitation Research Institute) as part of the Wood County Project for rehabilitation of persons with environmental or nonmedical disabilities. The Rehabilitation Gain Scale requires the client to respond to items reflecting vocational success and personal-social adjustment. While client self reports of, for example, source of income or weekly earnings may be accurate, serious methodological problems exist in self estimates of such items as physical condition, chance of getting a job, and emotional adjustment. The scale yields a pre-score, a post-score and a composite pre minus post change score.

Bolton (1974) notes that the averaging of such separate dimensions as vocational success and personal adjustment into a single composite probably limits the interpretation and meaning of the gain score.

The Rehabilitation Gain Scale was expanded by Human Service Systems, Inc. into the Human Service Scale, a self reported degree of change instrument for clients served through various human services. From an initial pool of 300 items, 80 were selected following item analysis and counselor ratings. These 80 items are designed to reflect Maslow's (1954) hierarchy of five basic needs, physiological, safety and security, love and belongingness, esteem, and self-actualization. For example, "How often are you bothered by muscle twitches, trembling, or shakes?" presumably relates to the individual's physiological needs. Although the internal consistencies of these separate HSS scales are largely acceptable, they do not appear to support the hierarchical ordering suggested above by Maslow's theory (Bolton, 1974). The Virginia Department of Vocational Rehabilitation modified the Wisconsin RRRI scale of rehabilitation gain by deleting extravocational items and adding 10 self perception items (Hawryluk, 1974). In general, one year after referral clients closed in status 26 did not differ significantly in composite gain from those still in process or closed not rehabilitated. Other states and research centers (e.g. California, West Virginia, and Michigan) have developed questionnaires that combine objective and subjective information about client outcome that may be used in the pre-post client gain paradigm.

The Rehabilitation Services Outcome Measure was developed by the Oklahoma Service Outcome Measurement Project to examine client gain in six aspects of rehabilitation change, (1) difficulty, e.g. employment prognosis, (2) educational status, e.g. months of on-the-job training, (3) economic and vocational status, e.g. weekly earnings, (4) physical functioning e.g. mobility, (5) adjustment to disability, e.g. client's confidence in himself as a worker, and (6) social competency, e.g. decision making ability. The Rehabilitation Services Outcome Measure is recorded by the counselor, but the same criticisms apply with regard to unreliability of judgmental items. Although a few counselors participating in a reliability study might produce acceptably reliable ratings from expanded case folders, the possibility exists of gross distortion and errors in judgement in such items as client's confidence or decision making ability (Westerheide & Lenhart, 1973). The Arkansas Division of Rehabilitation Service has been experimenting with an adapted form of the Oklahoma service outcome measure (Thurman, 1973). This adaption has eliminated some of the unreliable items from the Oklahoma Service Measurement Outcome Project, Form A (e.g., Physical Functioning Compensatory Skills with an inter-counselor reliability of .31). However, Arkansas retained some unreliable items from the Oklahoma Form A (e.g., Work Tolerance, General Health Status Other Than Disability, Employment Prognosis, Mobility and Vocational Level, with inter-counselor reliabilities of .55, .47, .56, .57, and .42 respectively) (Thurman, 1973; Westerheide & Lenhart, 1973).

Thus, some authors have tried to make a case for use of professional judgement or client judgement in evaluation of rehabilitation gain or outcome. The fact that such judgmental data have been used in attempts to demonstrate improvements in psychological and social functioning in the fields of social work and psychotherapy is not convincing. This whole tack of judgmental evaluation is fraught with difficulties of definition, validity and reliabilities. These issues are discussed in greater detail in a subsequent section. Sufficient at this point is the caution that interjudge reliability of "about .60," as well as weak definitions and validity of such areas as "personal meanings and experiencing" are inadequate separately (Rogers, 1961; Tomlinson & Hart, 1962). Taken together they are lethal to any such attempted measurement. Similar comment may be directed to the estimated client movement scale developed by Hunt and Kogan (1952).

Hetzler (1963) came nearer to recording of objective information in his social case work movement survey. He counted the presence in the home of such things as bed space, telephone, and alarm clock before and after services. While the validity of some of Hetzler's items may be questioned, cross rater reliability in such tabulation would be high. The issues of reliability and validity of outcome measures are paramount and integral to assessment of the effect of client, counselor, and administrative success.

III. RELIABILITY AND VALIDITY OF OUTCOME METRICS

The topics of reliability and validity of tests and measurement are treated in depth in earlier chapters. The purpose here is to consider these concepts as they relate to outcomes in rehabilitation.

Reliability of a measuring instrument indicates the accuracy with which it measures whatever it measures. If we know how reliable a measure is, we can know how much certainty to place in it. If we measured the length of a house several times with a steel measuring tape, we would obtain almost identical results. That is, we have obtained a high degree of reliability, and so we have confidence that the length is accurate. However, measuring the house by hand spans would be less reliable. The methods of reliability estimation traditionally presented are (a) the test-retest method, (b) the parallel-test method, (c) the split-half method, (d) the internal-consistency method, and (e) the inter-rater method.

Let us now see how these reliability methods relate to the types of rehabilitation outcome measures previously discussed. The following outcomes are sufficient for illustration:

1. *VR Status Closure* 08, 26, 28, 30.
2. *Earnings at Closure* (Kunce & Miller, 1972; Noble, 1973).
3. *Percent of Time* worked during a follow-up period (Neff, Novick, and Stern, 1968).
4. *Rehabilitation Gain Scale* (Reagles, Wright & Butler, 1970).
5. *Consumer's Measurement of Vocational Rehabilitation* (Hills & Ledgerwood, 1972).
6. *Rehabilitation Services Outcome Measure, Form A* (Westerheide & Lenhart, 1974).

The test-retest method of estimating reliability simply requires that the same test be given twice. Usually the same test is given to the same people a week or two after its first administration. If their scores from the two testing sessions correlate highly, performance is stable, and the test has high test-retest reliability. (1) VR Status

Closure, (2) Earnings at Closure, and (3) Percent of time should have near perfect test-retest reliability over a two week interval, (4) Rehabilitation Gain Scale, (5) Consumer's Measurement of Vocational Rehabilitation, and (6) Rehabilitation Services Outcome Measure would each probably show fairly high test-retest reliability, although some items in each measure would be unstable. Such suppositions of course are not data based, and work should be done to provide necessary reliability and validity data.

The parallel-test method is similar to test-retest. A parallel form of the test is administered and persons' scores on the two forms of the same test are correlated. There is probably no parallel form for outcome measures (1), (2), and (3). These criteria are in most cases clearly determinable and no such attempted reliability assessment is required. For outcome measures (4), (5), and (6), it would not be difficult to construct parallel forms. With relatively short tests such as (4), (5), and (6) if a short time interval between the tests is used, high reliability is likely.

Split-half reliability and internal consistency are similar to parallel tests. Essentially, each item has a parallel item in another form, but items from the two forms are mixed and presented as a single test. In a homogeneous scale all items are supposed to measure the same construct. So the items may be split in any manner (e.g. odd versus even), and they should correlate. Internal consistency estimates simply take into account all possible split-halves. Outcomes (1), (2), and (3) are single item measures and thus require no such reliability estimates. However, outcome measures (4), (5), and (6) are multi-item, and they are heterogeneous. The items are designed to tap several constructs or aspects of successful adaptation. In order to compute a split-half reliability coefficient, each item would be matched in difficulty and content with a parallel item. Outcome measures (4), (5), and (6) would yield low internal consistency reliability. As noted, they are multi-dimensional, heterogeneous, and would not be expected to have items that correlate highly with each other.

Probably the most important kind of reliability for outcomes in vocational rehabilitation is inter-rater reliability. For example, suppose three counselors were told that a given client had been accepted for services, provided services, placed in employment, and was gainfully employed one month later. The question asked each of the above counselors is, "Would you close the client as 08, 26, 28, or 30?" Counselor 1, 2, and 3 each say "26." The inter-rater reliability is perfect. Similarly there would be high agreement about such objective outcomes as (2) Earnings at Closure and (3) Percent of Time. In the (6) Rehabilitation Services Outcome Measure, Form A, inter-counselor reliability was good for objective items such as weekly earnings (.98), work status (.92), primary source of support (.92) and dependency on others for financial support (.92). Poor inter-counselor reliability was obtained for anticipated change (.35), employment prognosis (.56), availability of facilities (.45), vocational level (.42), general health status other than disability, (.47), mobility (.57), work tolerance (.55), compensatory skills (.31), and employment expectations (.59) (Westerheide & Lenhart, 1973).

Inter-rater reliability is inapplicable to many self report judgemental items in (4) and (5). Whereas both counselor and client might show close correspondence in reporting, "the time it took to get the services started," there could well be major discrepancies in perception of "My counselor's ability to help me." Although such discrepancies are instructive for feedback, they are characteristic of unreliable outcome measures.

Validity generally refers to whether the measurement actually measures the trait or phenomenon it was intended or designed to measure. There are also several different kinds of validity: predictive validity, concurrent validity, content validity, and construct validity are usually recognized. Predictive validity is achieved if the measure can predict another outcome after a given time. If two different but concurrent measures of the same phenomenon correlate; concurrent validity is established. Unlike predictive or concurrent validity, content validity is not expressed as a correlation coefficient. Content validity is simply the appearance that the test or criterion does indeed measure what it was designed to measure. Similarly, construct validity is not a single correlation coefficient, but is based in the theory that surrounds the variable that refers back to the theoretical and hypothetical definitions of the construct in question and attempts to relate it to other measures of that or related constructs.

Now, let us consider the previously noted sample outcome measures in terms of their validity. (1) The VR Status Closure appears to have at least moderate predictive validity. Follow-up studies usually indicate some correlation between whether clients were closed 26 and whether they are working now in a similar capacity. It certainly has concurrent validity since it is correlated with such other outcomes as higher earnings at closure and reduced public assistance. The status closure has every good content validity for most clients and employment situations. However, it should be expanded to give differential successful closures to such categories as homemakers and sheltered employment. The concept or construct of vocational rehabilitation is real. The 26 status closure system, with the above noted exceptions, is the short range epitome of vocational rehabilitation; can we take a disabled individual and provide services to facilitate his productive employment? The status closure system has good validity, but should be expanded to increase predictive and content validity for the diverse client population.

Some similar comments may be made about (2) Earnings at Closure and (3) Percent of Time worked during a follow-up period. Several follow-ups at expanded intervals should be part of the process and should allow for service and status modifications to increase predictive validity. Like the status closure (1), outcome measures (2) and (3) have high concurrent validity. They have good content validity and certainly are related to the vocational rehabilitation construct.

Outcome measures (4), (5), and (6) do not fare as well. Partly because of their recent vintage and in part because of their inclusion of unreliable items, we have little or no information about predictive validity. It would also be interesting as well as valuable to see how these measures relate to concurrent outcomes such as (1), (2), and (3). These measures appear to have good content validity, but validity cannot exceed the square root of the reliability. That is, if the reliability of a measure is r = .36, the greatest possible validity would be .60. With the inclusion of subjective judgemental items in outcome measures (4), (5), and (6) validity is reduced. Construct validity of the Rehabilitation Gain Scale appears to be poor in that several constructs or dimensions are considered. A similar situation exists with Consumer's Measurement of Vocational Rehabilitation and Rehabilitation Services Outcome Measure Form A. Perhaps separate reliability and validity should be determined for each sub scale, or dimension. Westerheide and Lenhart (1973) have laudably attempted to provide reliabilities for each of the items and subsection as well as the total instrument.

The foregoing discussion of reliability and validity leads to the following recommendations. We should seek creative expanded outcome criterion measures that would be broad enough to adequately describe diverse client groups and employment or occupational placement commensurate with services and training provided. Objective recording and criteria are paramount for reliable assessment and are integrally related to the potential validity of any outcome measure. Objectivity of outcomes and elimination of ambiguity have been emphasized by a number of authors (e.g. Bolton, 1972; Coone & Barry 1970). Careful consideration of the vocational rehabilitation concept must accompany development and selection of valid outcomes.

IV. TOWARD A SYSTEM OF REHABILITATION OUTCOME ANALYSIS AND EVALUATION

Program evaluation, weighted closure, case difficulty, and gain scale have become popular "catch" terms in vocational rehabilitation.

As previously noted there have been several attempts to operationalize case difficulty or develop weighted closure systems based on the 26 closure concept (e.g. Miller & Barillas, 1967; Sermon, 1972; Wallis & Bozarth, 1971). Such attempts have been handicapped by that inadequate closure status system. The 1974 IRI Prime Study Document on Measurement of Rehabilitation Outcome notes that the 26 closure as a measurement concept fails to consider any success short of ideal. Weighting systems have used case difficulty ala this ideal as a primary determinant of quality. Thus, in most weighted closure procedures a severely retarded client is more difficult and hence more desireable to rehabilitate, from the counselor's standpoint, than a slightly disabled client. Moreover recent legislation stresses this factor. While one may be more difficult, if both are genuine rehabilitations that would not have occurred by spontaneous remission or by some other mechanism, is one of these individuals more important to rehabilitate than the other? The heterogeneous 26 category does not provide sufficient outcome information about these two clients so that case difficulty may be viewed in context. Moreover, the IRI group states that analysts debunk the idea of "rehabilitating" X thousands of persons; they ask instead for data which measure impact in specific terms of earnings, job level, and reduction of public assistance.

The IRI Prime Study Group (1974) suggests taking first things first. Conclusive and comprehensive outcome variables and measures are prerequisite to, not dependent upon, effective program evaluation, effective counselor evaluation, and effective client service delivery evaluation. The IRI group essentially endorsed areas proposed by the Oklahoma Service Outcome Measurement Project: Physical, Educational, Vocational, Economic, and Psychosocial. The IRI group revised slightly as follows: Psychosocial Functioning; Physical Functioning; Economic Independence; and Vocational Functioning and Potential.

Some of these may presently be measured reliably and validly within a revised VR outcome context. Psychosocial has been omitted for reasons noted previously. It is indeed possible that objective and reliable psychosocial indices may be developed. The current state of such indices does not warrant inclusion at this time. However, researchers and practitioners should be encouraged to continue to seek and develop accurately reliable measures of psychosocial functioning and gain. The examples in Table 3 for four areas should be considered tenative at best, but illustrative of the possibilities that exist.

Physical capacity may be measured objectively and reliably. Several fairly good check lists already exist. For example, the West Virginia Rehabilitation Center uses a "Functional Capacity Evaluation" with five general activity areas: (1) Mobility, (2) Work Positioning, (3) Strength, (4) Reaching, and (5) Skilled Activity. Each of these five activity areas includes several objective behavioral assessments. Under Mobility, for example, one item is Stairs (5 steps client can go up and down three times). Under Work Positioning one item is *Kneeling* (client can assume a kneeling position and maintain it for a one-minute period). The answers to such items are clearly *yes* or *no*. Physical capacity may thus be objectively determined and reported.

Other gain or change scores may also be coded from Table 3. To illustrate, assume Client A was closed X432. We can readily see from

---

Insert Table 3 about here

Table 3 that he or she had no physical incapacity at acceptance (X), was reduced in public assistance by 50 to 100 dollars per month (4), increased earnings by 200 to 300 dollars per month (3), as a result of being placed in part time competitive employment (2). Suppose Client B was closed 4XX5. This client increased by 6 to 10 points in physical capacity (4), was not receiving public assistance (X), was not earning money (X), and was closed as a successful homemaker or unpaid family worker (5). Various closure profiles may thus be constructed to accurately represent client gain. Spaces are provided at the bottom of Table 3 for indication of quantitative closure information.

A more descriptive outcome scheme such as the one noted in Table 3 would then open the way for effective development of weighted closure and program evaluation. In program evaluation, agency researchers should be encouraged to look for "prime indicators" that relate to or cause those outcomes. These prime indicators should be sought from input (intake) as well as from intervention (process) variables. Examples from our research at the West Virginia Rehabilitation Research and Training Center are cited here to illustrate the search for prime indicators of various specified outcomes through four statistical models: (1) Chi Square, (2) Analysis of Variance, (3) Correlation, and (4) Multiple Linear Regression.

A. Chi Square Model

There are a total of 62 variables in RSA-300 Case Service Report providing client-specific data. Of the 62 variables, 42 are nominal (noncontinuous or discrete) variables and, therefore, yield frequency data. They include county code, referral source, sex, SSDI status at referral, race, major disabling condition, marital status, work status at referral, public assistance type at referral, etc.

Whenever there is a need for examining rehabilitation outcomes, inferentially, in connection with any of these nominal variables, chi square analysis can be useful.

For example, we have drawn a 10% stratified random sample, consisting of 1,388 cases, from all the cases served during the fiscal year 1969-70 in the state of West Virginia. The breakdown of this sample in terms of closure statuses is as follows: 670 08's (clients not accepted for services), 616 26's (clients accepted for services and closed employed), 51 28's (clients accepted for and received all necessary services but closed unemployed), and 51 30's (clients accepted for and received some services but unsuccessfully closed). To answer the question, "What characterized clients who were accepted for vocational rehabilitation services at intake?" comparisons of those intake characteristics which are by nature nominal variables between the accepted group (26's, 28's, and 30's) and rejected group (08's) may be carried out using chi square statistics. Table 4 shows the result of such comparisons on variable REFERRAL SOURCE and variable SEX. Notice that one-way chi square analysis, with one degree of freedom, was conducted for each category of the nominal variable separately. That is, each of the seven categories of variable REFERRAL SOURCE

Insert Table 4 about here

(educational institutions, hospitals, health agencies, welfare agencies, public organizations, private organizations, and individuals) and each of the two categories of variable SEX (males and females) was analyzed in terms of actual versus expected numbers of cases for the accepted and rejected groups. Notice also that the expected numbers of cases for the two groups were determined on the basis of the distribution of 718 clients who were accepted (representing 51.7%) and 670 clients who were not accepted (representing 48.3%) in the sample of 1,388 clients (100%).

Consider for instance the category "educational institutions" of variable REFERRAL SOURCE the actual number of cases observed for the accepted and rejected groups were 37 and 41, respectively and in order to maintain the null hypothesis we would expect 51.7% and 48.3% of the 78 clients (the sum of 37 and 41) referred by educational institutions to be found in the accepted and rejected groups. Therefore, the expected frequencies for the accepted and rejected groups were 78 x 0.517= 40.3 and 78 x 0.483= 37.7, respectively. As you can see, the discrepancies between the actual and expected frequencies for the two groups (37 versus 40.3 and 41 versus 37.7) were rather small and the resultant chi square value of 0.59 is not significant, indicating that clients referred by educational institutions did not produce unexpectedly smaller or greater numbers of accepted cases.

Let us take a look at the category "males" of variable SEX. Of the 804 males in the sample, 344 were accepted and 460 were rejected. The expected frequencies for the two groups were 804 x 0.517= 415.7 and

804 x 0.483= 388.3, respectively. The chi square value of 25.61, with 1 degree of freedom, is significant beyond the .001 level, indicating that unexpectedly fewer males were accepted (344 actual as opposed to 415.7 expected) or unexpectedly more males were rejected for services (460 actual versus 388.3 expected).

To summarize the findings presented in Table 4, significant chi square values show that acceptance for vocational rehabilitation services seemed to be facilitated by characteristics (1) referral source private organizations (p<.001), (2) referral source individuals (p<.001), and (3) females (p<.001) and inhibited by characteristics (1) referral source public organizations (p<.01) and (2) males (p<.001). This is simply a numerical example; a number of such tables may be constructed from other intake information.

Now, consider this question, "Of the clients who have been accepted for services, many were successfully closed. What characterized them?" Table 5 presents the result of comparisons between the successfully closed group (26's, N=616) and unsuccessfully closed group (28's and 30's, N=102) on each of the categories of variables REFERRAL SOURCE and SEX. The expected numbers of cases for the two groups within each category were determined on the basis of the sample ratios 616/(616 + 102)= 0.858 and 102/(616 + 102)= 0.142. Five out of the nine chi square values in Table 5 are significant (p<.001). Comparisons of actual and expected frequencies of these five significant categories especially with respect to the successfully closed group reveal that

Insert Table 5 about here

(1) referral source individuals and (2) females were facilitating characteristics, while (1) referral source hospitals, (2) referral source welfare agencies, and (3) males were inhibiting characteristics for successful rehabilitation.

B. Analysis of Variance Model

In the RSA-300 Case Service Report, measurement (or metric) data on these 20 continuous and/or ordinal variables are available: age, months in statuses 00-02, months since last closure, number of dependents, total number in family, highest grade completed, weekly earnings at referral, total monthly family income at referral, public assistance monthly amount at referral, months on public assistance at referral, all services total cost, rehabilitation facilities total cost, social security trust funds total cost, extended evaluation total cost, weekly earnings at closure, public assistance monthly amount at closure, months in extended evaluation (04 or 06), months from acceptance to closure (10-24), months in training (18), and months ready for or in employment (20 or 22).

The analysis of variance (ANOVA) approach can be taken when difference between groups (for instance, males versus females, clients accepted versus clients rejected, clients successfully closed versus clients unsuccessfully closed, etc.) on any of the above continuous variables is to be investigated inferentially.

The question, "What characterized clients who were accepted for vocational rehabilitation services at intake?" can thus be answered by comparing clients who were accepted for services with those who were not on each of the ten continuous variables tapped at referral using the one-way analysis of variance technique. Table 6 summarizes the results of such comparisons conducted for the West Virginia FY 69-70 cases.

Insert Table 6 about here

Of the ten variables examined, two significantly differentiated the two groups. As compared to those who were not accepted, clients who were accepted for services are characterized by significantly lower mean months in statuses 00-02 ($p<.001$) and higher mean weekly earnings at referral ($p<.05$). More specifically, data showed significant mean differences between the accepted and rejected groups on (1) months in statuses 00-02, period of time from referral status to applicant status, (mean 3.6 for the former group versus mean 8.7 for the latter group, with $F=156.55$, 1df/1282df, $p<.001$) and (2) weekly earnings at referral (mean 19.0 for the former group versus mean 13.7 for the latter group, with $F=5.37$, 1df/985df, $p<.05$).

Table 7 summarizes the results of 20 one-way analyses of variance comparing clients who were successfully closed with clients who were unsuccessfully closed (all clients had been accepted for vocational rehabilitation services) on the 20 continuous variables for the same West Virginia FY 69-70 ten percent sample. The analyses were undertaken to answer this question: "What characterized clients who were successfully closed?"

Insert Table 7 about here

The findings reveal that there were significant mean differences between the successfully closed and unsuccessfully closed groups on 9 variables: (1) the highest grade completed (mean 9.2 for the former group versus mean 8.4 for the latter group, F=5.81, ldf/706df, p<.05), (2) weekly earnings at referral (mean 21.2 versus mean 5.9, F=19.39, ldf/692df, p<.001), (3) monthly family income at referral (mean 2.5 versus mean 1.5, F=10.42, ldf/689df, p<.01), (4) all services total cost (mean 580.2 versus mean 185.7, F=19.81, ldf/714df, p<.001), (5) weekly earnings at closure (mean 49.5 versus mean 1.9, F=84.31, ldf/669df, p<.001), (6) public assistance monthly amount at closure (mean 7.8 versus mean 18.1, F=6.27, ldf/618df, p<.05), (7) months in extended evaluation (mean 0.1 versus mean 0.6, F=15.57,ldf/576df, p<.001), (8) months from acceptance to closure (mean 13.0 versus mean 23.9, F=41.33, ldf/713df, p<.001), and (9) months ready for or in employment (mean 3.6 versus mean 0.9, F=18.30, ldf/691df, p<.001).

In other words, as compared to those who were unsuccessfully closed, clients who were successfully closed are characterized by significantly higher mean grade level (p<.05), higher mean weekly earnings at referral (p<.001), higher mean monthly family income at referral (p<.01), higher mean cost for services (p<.001), higher mean weekly earnings at closure (p<.001), lower mean public assistance monthly amount at closure (p<.05), lower mean months in extended evaluation (p<.001), lower mean months from acceptance to closure (p<.001), and higher mean months ready for or in employment (p<.001).

C. Correlation Model

Of the 20 continuous variables in the RSA-300 Case Service Report, 10 are intake variables (age, months in statuses 00-02, months since last closure, number of dependents, total number in family, highest grade completed, weekly earnings at referral, total monthly family income at referral, public assistance monthly amount at referral, and months on public assistance at referral). The other 10 are either process or outcome variables (all services total cost, rehabilitation facilities total cost, social security trust funds total cost, extended evaluation total cost, weekly earnings at closure, public assistance monthly amount at closure, months in extended evaluation, months from acceptance to closure, months in training, and months ready for or in employment).

Whenever there is a need to determine, descriptively, the extent to which any two of these continuous variables may be associated with each other, the product-moment correlation coefficient (Pearson r) can be used. A 20 x 20 correlation matrix presented in Table 8 shows intercorrelations among the 20 continuous variables for the West Virginia FY 69-70 10% sample.

Insert Table 8 about here

We may want to check how some of the process and outcome variables correlated with intake variables. For example, Variable 11 ALLSERV (total cost for all services) represents the most important cost variable. This process variable showed significant correlations with these intake variables: (1) age (r= -.13,

$N= 1,364$, $p<.001$), (2) months in statuses 00-02 ($r= -.08$, $N= 1,261$, $p<.01$), (4) number of dependents ($r= -.07$, $N= 1,034$, $p<.05$), (6) highest grade completed ($r= .13$, $N= 1,023$, $p<.001$), and (7) weekly earnings at referral ($r= -.07$, $N= 984$, $p<.05$). In other words, total cost for all services correlated positively with educational level and negatively with age, months in statuses 00-02, number of dependents, and weekly earnings at referral.

Months from acceptance to closure, variable 18 (CL01024) is an important time variable. This process variable correlated significantly and negatively with two intake variables: (1) age ($r= -.18$, $N= 612$, $p<.001$) and (7) weekly earnings at referral ($r= -.18$, $N= 691$, $p<.001$).

(15) Weekly earnings at closure (WKEARN2) and (16) public assistance monthly amount at closure (ASSAMT2) constitute two outcome variables. As shown in Table 8, weekly earnings at closure possessed significantly positive correlations with (4) number of dependents ($r= .14$, $N= 672$, $p<.001$), (6) highest grade completed ($r= .24$, $N= 662$, $p<.001$), (7) weekly earnings at referral ($r= .41$, $N= 659$, $p<.001$), and (8) monthly family income at referral ($r= .24$, $N=651$, $p<.001$). Negative correlations occurred with (1) age ($r= -.18$, $N= 672$, $p<.001$). The other outcome variable (16) public assistance monthly amount at closure correlated positively with (4) number of dependents ($r= .29$, $N= 621$, $p<.001$), (5) total number in family ($r= .20$, $N= 621$, $p<.001$), (9) public assistance monthly amount at referral ($r= .71$, $N= 606$, $p<.001$), and (10) months on public assistance at referral ($r= .53$, $N= 610$, $p<.001$). It correlated negatively with (6) highest grade completed ($r= -.13$, $N= 612$, $p<.01$) and (8) total monthly family income at referral ($r= -.12$, $N= 601$, $p<.01$).

D. Multiple Linear Regression Model

Capitalizing on the availability of the RSA-300 data on the 20 continuous variables covering the rehabilitation intake, process, and outcome stages, we may address ourselves to a general question such as, "What combination of intake variables would provide an optimum prediction of a given outcome variable?" This question can be answered statistically by identifying an optimum multiple linear regression equation $Y=a+b_1X_1+b_2X_2+.........+b_kX_k$ where Y is a dependent variable (i.e. an outcome variable), a denotes a constant, b_k represents the kth regression coefficient, and X_k stands for the kth predictor variable (i.e. the kth intake variable).

For instance, weekly earnings at closure (WKEARN2, an outcome variable) may be predicted by using the 9 intake variables as combined predictors. Table 9 summarizes the results of a step-wise multiple linear regression analysis involving clients in the West Virginia FY 69-70 10% sample who had all the data on the dependent variable (weekly earnings at closure) and the 9 predictor variables.

Insert Table 9 about here

As can be seen in step 1, the best single predictor of this outcome variable (WKEARN2) was weekly earnings at referral (WKEARN), with the correlation coefficient (R) of 0.40 ($N= 539$, $p<.001$). When all the 9 predictor variables were used for prediction (see Step 9), the resultant multiple correlation coefficient was hiked to 0.47 ($N= 539$, $p<.001$) which is not significantly different from 0.46, the coefficient for Step 3. This means that the multiple linear regression determined by Step 3 would provide an optimum prediction. The equation is as follows:

$$Y = 40.140 + 0.557 X_1 - 0.569 X_2 + 1.572 X_3$$

where Y = weekly earnings at closure (WKEARN2)

X_1 = weekly earnings at referral (WKEARN)

X_2 = age (AGE)

X_3 = highest grade completed (GRADE)

What combination of intake variables would provide an optimum prediction of public assistance monthly amount at closure (ASSAMT2, another outcome variable)? The results of a step-wise multiple linear regression analysis with the West Virginia FY 69-70 10% sample are summarized in Table 10.

Insert Table 10 about here

Step 1 shows that public assistance monthly amount at referral (ASTAMT) was the best single predictor of the dependent variable (public assistance monthly amount at closure, ASSAMT2), with a correlation coefficient of 0.69 ($N = 511$, $p < .001$). When all the 9 intake variables were used as combined predictors (Step 9) the multiple linear regression coefficient (R) reached 0.71 which is the same as that of the 3 predictor variables combined (see Step 3). In other words, Step 3 gives the optimum predictive model which is as follows:

$$Y = 8.895 + 0.552 X_1 + 1.825 X_2 - 1.007 X_3$$

where Y = public assistance monthly amount at closure (ASSAMT2)

X_1 = public assistance monthly amount at referral (ASTAMT)

X_2 = number of dependents (NODEP)

X_3 = highest grade completed (GRADE)

Overview

The rehabilitation system is viewed herein as an input (intake) - intervention (process) - output (outcome) paradigm. Sound methods exist for assessing relations of intake and process variables to rehabilitation outcomes. Adequate experimental methods and statistical procedures are available for the explication of such relationships.

There exists, however, a criterion problem in rehabilitation. Although few would quarrel with productive employment as an ultimate criterion, many have called for a more broadly descriptive taxonomy of outcomes. Outcome classification should also take into account such factors as gains in physical functioning and dependency reduction. It is of paramount importance that such outcome measures be valid and reliable. That is, any criteria selected must contribute in a substantial manner to the rehabilitation construct, and they must be objectively measurable.

Outcomes of this sort may be examined through chi square, analysis of variance, correlational, and stepwise regression procedures. Program evaluation should consist in determining how well specified criteria are achieved and in modifying or adjusting to prime indicators of those outcomes where needed.

References

1. Aiduk, R., and Longmeyer, D.: Prediction of client success with vocational rehabilitation in a state mental hospital. *Rehabilitation Counseling Bulletin*, *15*:3-10, 1972.
2. Ayer, M. J., Thoreson, R. W., and Butler, A. J.: Predicting rehabilitation success with the MMPI and demographic data. *Personnel and Guidance Journal*, *40*:634-637, 1966.
3. Barry, J. R., Dunteman, G. H., and Webb, M. W.: Personality and motivation in rehabilitation. *Journal of Counseling Psychology*, *15*:237-244, 1968.
4. Barry, J. R., and Malinovsky, M. R.: Client motivation for rehabilitation: A review. Gainesville: University of Florida Regional Rehabilitation Research Institute, 1963.
5. Ben-Yishay, Y., Gertsman, L., Diller, L., and Hans, A.: Prediction of rehabilitation outcomes from psychometric parameters in left hemiplegics. *Journal of Consulting and Clinical Psychology*, *34*:436-441, 1970.
6. Bolton,

7. Bolton, B.: The prediction of rehabilitation outcomes. *Journal of Applied Rehabilitation Counseling*, *3*:16-24, 1972.

8. Burstein, A., Soloff, A., Gillespie, H., and Haase, M.: Prediction of hospital discharge of mental patients by psychomotor performance: Partial replication of Brooks and Weaver. Perceptual and Motor Skills, 24:127-134, 1967.

9. Campbell, D. T., and Stanley, J. C.: Experimental and Quasi-Experimental Designs for Research. Chicago, Rand McNally, 1963.

10. Clayton, W. H.: Correlates of client-counselor interaction and rehabilitation outcome. Dissertation Abstracts International, 31(4-a):1572-A, 1970.

11. Cook, T. E.: Psycho-social barriers to rehabilitation in Appalachia. Rehabilitation Counseling Bulletin, 11:98-105, 1967.

12. Coone, J. G., and Barry, J. R.: The oscillating r phenomenon in the prediction of rehabilitation outcome. Rehabilitation Research and Practice Review, 1:

13. Cunningham, M. K., Botwinik, J. D., and Weickert, A. A.: Community placement of released mental patients: A five-year study. Social Work, 14:54-61, 1969.

14. Day, Cummings, Anderson, and Iverson, Client characteristics and their relation to outcome: A review of previous research. Unpublished manuscript. Minneapolis, Minnesota: Institute of Interdisciplinary Studies, American Rehabilitation Foundation, 1969.

15. DeMann, M. M.: A predictive study of rehabilitation counseling outcomes. Journal of Counseling Psychology, 10:340-343, 1963.

16. Drasgow, J., and Dreher, R.: Predicting client readiness for training and placement in vocational rehabilitation. *Rehabilitation Counseling Bulletin*, 9:94-98, 1965.

17. Eber, H. W.: Multivariate analyses of a vocational rehabilitation system. *Multivariate Behavioral Research Monograph*, No. 66-1, 1966.

18. Gilbert, D. H., and Lester, J. T.: The relationship of certain personality and demographic variables to success in vocational rehabilitation. Unpublished manuscript, Orthopedic Hospital, Los Angeles: 1970.

19. Goff, C.: An objective index for measuring the vocational rehabilitation counselor's case - load difficulty. Unpublished doctoral dissertation, University of Oklahoma, 1969.

20. Goss, A.: Predicting work success for psychiatric patients with Kuder Preference Record. *Educational and Psychological Measurement*, *28*:571-576, 1968.

21. Goss, A., Morosko, T., and Sheldon, R.: Use of the Edwards Personal Preference Schedule with alcoholics in a vocational rehabilitation program. *The Journal of Psychology*, *68*:287-289, 1968.

22. Gressett, J.: Prediction of job success following heart attack. *Rehabilitation Counseling Bulletin*, *13*:10-14, 1969.

23. Grigg, C. M., Holtmann, A. G., and Martin, P. Y.: *Vocational Rehabilitation for the Disadvantaged*. D. C. Heath and Company, Lexington, Massachusetts, 1970.

24. Hammond, C. D., Wright, G. N., and Butler, A. J.: Caseload feasibility in an expanded vocational rehabilitation program, *Wisconsin Studies in Vocational Rehabilitation*, Monograph VI, Madison: The University of Wisconsin, Regional Rehabilitation Research Institute, 1968.

25. Havryluk, A.: Rehabilitation gain: A better indicator needed. *Journal of Rehabilitation*, *38*:22-25, 1972.

26. Heilburn, A. B., and Jordan, B. T.: Vocational rehabilitation of the socially disadvantaged: Demographic and intellectual correlates of outcome. *Personnel and Guidance Journal*, *47*:213-217, 1968.

27. Hetzler, S.: A scale for measuring case severity and case movement in public assistance. *Social Casework*, *44*:445-451, 1963.

28. Hills, W. G., and Ledgerwood, D. E.: Consumer's measurement of vocational rehabilitation in New Mexico. (and in North Dakota). Unplublished manuscripts, Norman, Oklahoma, Regional Rehabilitation Research Institute, University of Oklahoma, 1972.

29. Hunt, J. M., and Kogan, L. F.: Measuring results in social casework. New York, Family Service Association of America, 1952.

30. IRI Prime Study Group.: *Measurements of Outcomes*. Washington, D. C., S.R.S. 1974.

31. Kelman, H. R., and Willner, A.: Problems in measurement and evaluation of rehabilitation. *Archives of Physical Medicine and Rehabilitation*, *43*:172-181, 1962.

26. Havryluk, A.: Rehabilitation gain: A new criterion for an old concept. Unpublished manuscript, Richmond, Va., Old Dominion University, 1974.

32. Kilburn, K. L., and Sanderson, R. E.: Predicting success in a vocational rehabilitation program with the Raven Colored Progressive Matrices. Educational and Psychological Measurement, 26:1031-1034, 1966.

33. Krantz, G.: Critical vocational behaviors. Journal of Rehabilitation, 37:14-16, 1971.

34. Kunce, J. T., Mahoney, R. J., Campbell, R. R., and Finley, J.: Rehabilitation in the concrete jungle. Research Series No. 3, University of Missouri - Columbia, Regional Rehabilitation Research Institute, 1969.

35. Kunce, J. T., and Miller, D. E.: Simplified prediction: A follow-up study. Journal of Counseling Psychology, 19:505-508, 1972.

36. Lane, J. M., and Barry, J. R.: Recent research on client motivation. Rehabilitation Research and Practice Review, 1:5-25, 1970.

37. Lawlis, G. F., and Bozarth, J. D.: Considerations for the development of weighting systems for the evaluation of counselor effectiveness. Rehabilitation Counseling Bulletin, 14:133-140, 1971.

38. Leary, P. A., and Tseng, M. S.: The vocational rehabilitation process - explained. Journal of Rehabilitation, 40:9-34, 1974.

39. Lorei, T.: Prediction of community stay and employment for released psychiatric patients. Journal of Consulting Psychology, 31:349-357, 1967.

40. Lowe, C. M.: Prediction of posthospital work adjustment by the use of psychological tests. Journal of Counseling Psychology, 14:248-252, 1967.

41. MacGuffie, R. A.: Relationship between the Social Vocabulary Index and the Interaction Scale and rehabilitation success. Journal of Counseling Psychology, 17:289-290, 1970.

42. MacGuffie, R. A., Janzen, F. V., Samuelson, C. O., and McPhee, W. N.: Self-concept and ideal-self in assessing the rehabilitation applicant. Journal of Counseling Psychology, 16:157-161, 1969.

43. Maslow, A. H.: Motivation and Personality. New York, Harper, 1954.

44. McPhee, W. M., and Magleby, F. L.: Success and failure in vocational rehabilitation. Personnel and Guidance Journal, 38:497-499, 1960.

45. Miller, D. E., Kunce, J. T., and Getsinger, S. H.: Prediction of job success for clients with hearing loss. Rehabilitation Counseling Bulletin, 16:21-28, 1972.

46. Miller, L. A., and Allen, G.: The prediction of future outcome among OASI referrals using NMZ Scores. Personnel and Guidance Journal, 45:349-352, 1966.

47. Miller, L. A., and Barillas, M. G.: Using weighted 26-closures as a more adequate measure of counselor and agency effort in rehabilitation. Rehabilitation Counseling Bulletin, 11:117-121, 1967.

48. Muthard, J. E. (Ed.): Training guides in case load management for vocational rehabilitation staff, final report, Committee on Caseload Management, Rehabilitation Services Series No. 66-22, U. S. Department of Health, Education, and Welfare, Vocational Rehabilitation Administration, Washington, D. C., 1965.

49. Muthard, J. E., and Miller, L. A.: The criteria problem in rehabilitation counseling. Iowa City: College of Education, State of Iowa, 1966.

50. Nadler, E.: Prediction of sheltered shop work performance of individuals with severe physical disability. Personnel and Guidance Journal, 36: 95-98, 1957.

51. Neff, W. S.: The use of the Rorschach in distinguishing vocationally rehabilitable groups. Journal of Counseling Psychology, 2:207-211, 1955.

52. Neff, W. S., Novick, B., and Stern, B.: A follow-up counseling program. Final report, Jewish Occupational Council, New York: 1968.

53. Noble, J. H.: Actuarial system for weighting case closures. Rehabilitation Record, 14:34-37, 1973.

54. Pearlman, L. G., and Hylbert, K. W.: Identifying potential dropouts at a rehabilitation center. Rehabilitation Counseling Bulletin, 13:217-225, 1969.

55. Reagles, K. W., Wright, G. N., and Butler, A. J.: A scale of rehabilitation gain for clients of an expanded vocational rehabilitation program. *Wisconsin Studies in Vocational Rehabilitation*, Monograph XIII, Series 2, Madison, Wisconsin; The University of Wisconsin, Regional Rehabilitation Research Institute, 1970.

56. Rogers, C. R.: The process equation of psychotherapy. *American Journal of Psychotherapy*, 15:27-45, 1961.

57. Rehabilitation Services Administration: *RSA Long-Range Plan*, Part I, 1973.

58. Salomone, P. R.: Client motivation and rehabilitation counseling outcome. *Rehabilitation Counseling Bulletin*, 15:11-20, 1972.

59. Sankovsky, R.: Predicting successful and unsuccessful rehabilitation outcome: A review of literature. Grant No. RT-14, Pittsburgh: University of Pittsburgh, December, 1968.

60. Schletzer, V. M., Dawis, R. V., England, G. W., and Lofquist, L. H.: Factors related to employment success. *Minnesota Studies in Vocational Rehabilitation*, Bulletin 27, University of Minnesota: 1959.

61. Sermon, D. T.: The Difficulty Index: An expanded measure of counselor performance. St. Paul: Minnesota Division of Vocational Rehabilitation, 1972.

62. Silver, D. L.: A look at evaluation of vocational rehabilitation counselor performances. *Journal of Rehabilitation*, *35*:13-14, 1969.

63. Stein, C. I., Bradley, A. D., and Buegel, B.: A test of basic assumptions underlying vocational counseling utilizing a differential criterion method. *Journal of Counseling Psychology*, *17*:93-97, 1970.

64. Taylor, F.: The general aptitude test battery as predictor of vocational readjustment by psychiatric patients. *Journal of Clinical Psychology*, *19*:130, 1963.

65. Thurman, D. G.: Outcome measures progress report. Division of Rehabilitative Service, State of Arkansas, 1973.

66. Tomlinson, T. M., and Hart, J. T., Jr.: A validation study of the process scale. *Journal of Consulting Psychology*, 26:74-78, 1962.

67. Tosi, D. V., and Vesotsky, L. R.: Successful rehabilitation as a function of client status. *Psychological Reports*, *27*:37-38, 1970.

68. Tseng, M. S.: Predicting vocational rehabilitation drop-outs from psychometric attributes and work behaviors. *Rehabilitation Counseling Bulletin*, *15*:154-159, 1972.

69. Viaille, H.: Operations research program in the Oklahoma Vocational Rehabilitation Agency. VRA Grant No. RD-946, Oklahoma City: Oklahoma Vocational Rehabilitation Agency, 1968.

70. Wallis, J. H., and Bozarth, J. D.: The development and evaluation of weighted DVR case closures. *Rehabilitation Research and Practice Review*, 2:55-60, 1971.

71. Weiner, H.: Characteristics associated with rehabilitation success. *Personnel and Guidance Journal*, *42*:687-694, 1964.

72. Westerheide, W. J., and Lenhart, L.: Case difficulty and client change: A review of the literature. Oklahoma City, Department of Institutions, Social and Rehabilitative Services, 1974.

73. Westerheide, W. J., and Lenhart, L.: Development and reliability of a pretest-posttest rehabilitation services outcome measure. Rehabilitation Research and Practice Review, 4:15-23, 1973.

74. Wright, G. N. (Ed.): Clinical versus statistical prediction in Wisconsin studies in vocational rehabilitation. Series I, Monograph VII, Madison, University of Wisconsin, 1968.

75. Zawada, A. R.: Florida Difficulty Index in achieving rehabilitation. Unpublished manuscript, Division of Vocational Rehabilitation, Tallahassee, Florida, 1973.

Footnote

[1] Preparation of this manuscript was supported in part by the Social and Rehabilitation Services (HEW) through the West Virginia Regional Rehabilitation Research and Training Center (W.V.U. and W.V.D.V.R.). Appreciation is expressed to John Stuart, David Hassick, James DiFebo, and William Pierce for their aid.

TABLE 1

The One-Group Pretest-Posttest Design as Applied To The Intake-Process-Outcome Paradigm in Rehabilitation

Intake	Process	Outcome
O_1	X	O_2

TABLE 2

The Pretest-Posttest Control Group Design as Applied To The Intake-Process-Outcome Paradigm In Rehabilitation

Intake	**Process**	**Outcome**
O_{11}	X	O_{12}
O_{21}		O_{22}

TABLE 4

Chi Square Model Numerical Example 1 -
What Characterized Clients Who Were Accepted For VR Services?
WV FY69-70 10% Sample

Variable	Those Accepted (N=718)		Those Not Accepted (N=670)		χ^2
	Actual N	Expected N	Actual N	Expected N	
REFFERAL SOURCE					
Educational Institutions	37	40.3	41	37.7	0.59
Hospitals	93	85.3	72	79.7	1.44
Health Agencies	25	21.2	16	19.8	1.41
Welfare Agencies	56	51.7	44	48.3	0.74
Public Organizations	87	215.6	330	201.4	7.85**
Private Organizations	16	8.8	1	8.2	12.21***
Individuals	404	293.7	164	274.3	85.78***
SEX					
Males	344	415.7	460	388.3	25.61***
Females	374	301.9	210	282.1	35.65***

** p<.01

*** p<.001

A Tentative V.R. Outcome Classification Proposal

Physical Capacity and Mobility Increase From Acceptance to Closure	Public Assistance Decrease Per Month From Acceptance to Closure	Earnings Increase Per Month From Acceptance to Closure	Vocational Placement At Closure*
1 = 21 to 25 points Gain	1 = more than $200	1 = more than $400	1 = Competitive full time
2 = 16 to 20 points Gain	2 = $150>$200	2 = $300>$400	2 = Competitive part time
3 = 11 to 15 points Gain	3 = $100>$150	3 = $200>$300	3 = Self Employed or BEP
4 = 6 to 10 points Gain	4 = $50 >$100	4 = $100>$200	4 = Sheltered
5 = 1 to 5 points Gain	5 = $0 > $50	5 = $0 > $100	5 = Homemaker or Unpaid Family Worker
6 = No Increase or Decrease	6 = No Increase or Decrease	6 = No Increase or Decrease	6 = Student, Trainee, or Other
7 = Decrease in P.C.	7 = Increase in P.A.	7 = Decrease in Earnings	7 = Unsuccessful-Other Reasons (Status 28)
X = Not Applicable Because No Physical Incapacity At Acceptance	X = Not Applicable because No P.A. at Acceptance	X = Not Applicable because Voc. Closure was 5, 6, 7, 8, or 9	8 = Unsuccessful-Other Reasons(Status 30)
			9 = Unsuccessful- Not Accepted (Status 08)

Physical Capacity Points At Closure	P.A. Amount per month At Closure	Earnings per month At Closure	Occupational Title At Closure

* This column reflects changes recommended by the IRI Prime Study Group, Measurement of Outcomes, 1974.

TABLE 5

Chi Square Model Numerical Example 2 -
What Characterized Clients Who Were Successfully Closed?
WV FY69-70 10% Sample

Variable	Those Successfully Closed (N=616)		Those Unsuccessfully Closed (N=102)		χ^2
	Actual N	Expected N	Actual N	Expected N	
REFFERAL SOURCE					
Educational Institutions	35	31.7	2	5.3	2.40
Hospitals	56	79.8	37	13.2	50.01*
Health Agencies	24	21.5	1	3.5	2.08
Welfare Agencies	39	48.0	17	8.0	11.81*
Public Organizations	69	74.6	18	12.4	2.95
Private Organizations	16	13.7	0	2.3	2.69
Individuals	377	346.6	27	57.4	18.77*
SEX					
Males	270	295.2	74	48.8	15.16*
Females	346	320.9	28	53.1	13.82*

*** p<.001

TABLE 6

Analysis of Variance Model Numerical Example 1 – What Characterized Clients Who Were Accepted for VR Services? WV FY69-70 10% Sample

Variable	Those Accepted		Those Not Accepted		F
	Mean	N	Mean	N	
Age	38.1	718	37.9	670	0.09
Months 00-02	3.6	636	8.7	648	156.85***
Months Last Closure	15.7	74	14.0	21	0.27
No. Dependents	1.4	718	1.2	322	2.31
No. Family	3.6	718	3.7	319	0.59
Grade	9.1	708	8.9	321	0.69
Wk. Earnings (Referral)	19.0	694	13.7	293	5.37*
Mo. Family Income	2.3	690	2.0	268	2.10
PA Mo. Amount (Referral)	13.2	670	15.3	298	0.47
Mo. on PA (Referral)	0.4	674	0.6	293	1.95

*p<.05

***p<.001

TABLE 7

Analysis of Variance Model Numerical Example 2 - What Characterized Clients Who Were Successfully Closed? WV FY69-70 10% Sample

Variable	Successfully Closed		Unsuccessfully Closed		F
	Mean	N	Mean	N	
Age	38.3	616	37.4	102	0.30
Months 00-02	3.7	540	2.9	96	2.43
Months Last Closure	15.8	62	15.3	12	0.02
No. Dependents	1.3	616	1.5	102	0.50
No. Family	3.6	616	3.5	102	0.31
Grade	9.2	607	8.4	101	5.81*
Wk. Earnings (Referral)	21.2	595	5.9	99	19.39***
Mo. Family Income	2.5	596	1.5	94	10.42**
PA Mo. Amount (Referral)	12.0	574	20.3	96	2.84
Mo. on PA (Referral)	0.4	579	0.5	95	0.29
All Cost	580.2	615	185.7	101	19.81***
Facility Cost	142.4	542	69.3	96	1.40
SS Fund Cost	23.6	525	8.9	92	0.20
Ext. Eval. Cost	5.4	512	8.7	89	0.09
Wk. Earnings (Closure)	49.5	594	1.9	77	84.31***
PA Mo. Amount (Closure)	7.8	536	18.1	84	6.27*
Mo. in Ext. Eval.	0.1	487	0.6	91	15.57***
Mo. Acceptance - Closure	13.0	614	23.9	101	41.33***
Mo. in Training	3.4	518	1.9	94	2.13
Mo. Ready for or in Empl.	3.6	600	0.9	93	18.30***

* $p<.05$
** $p<.01$
*** $p<.001$

TABLE 8

Correlation Model Numerical Example 1 -

<.10
*<.05
**<.01
***<.001

INTERCORRELATIONS AMONG CONTINUOUS VARIABLES

10% Sample (FY 69-70)

	n r	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	AGE		1284	95	1040	1037	1029	987	958	968	967	1364	1259	1241	975	672	622	578	715	612	693
2.	MØ0002	-.08**		84	955	952	944	909	878	895	892	1261	1171	1155	909	598	554	517	633	549	616
3.	MØCLØS	NS	NS		95	95	92	91	91	89	89	95	81	81	70	70	64	59	74	61	71
4.	MØDEP	.14***	NS	NS		1037	1029	984	957	967	966	1034	935	915	780	672	621	578	715	612	693
5.	MØFAM	-.28***	.09**	NS	.45***		1026	981	956	965	964	1031	932	912	779	672	621	578	715	612	693
6.	GRADE	-.27***	-.12***	NS	-.06*	NS		973	946	956	955	1023	924	904	769	662	612	569	705	603	683
7.	WKEARN	.07*	-.11***	NS	.20***	NS	.17***		930	939	940	984	906	890	763	659	615	573	691	601	674
8.	MØINC	-.19***	NS	NS	NS	.29***	.27***	.44***		907	905	954	865	848	729	651	601	561	687	592	667
9.	ASTAMT	NS	NS	NS	.33***	.25***	-.10**	-.11**	-.12***		956	963	899	881	754	636	606	558	667	588	652
10.	ASTTIME	NS	.10**	NS	.19***	.18***	-.15***	-.11**	-.14***	.70***		962	901	884	759	642	610	565	671	594	657
11.	ALLSERV	-.13***	-.08**	NS	-.07*	NS	.13***	-.07*	NS	NS	NS		1259	1241	975	670	620	577	713	610	691
12.	REHFAC	-.10***	NS	NS	.08	NS	.08*	-.07*	NS	NS	NS	.62***		1235	975	606	585	549	635	572	623
13.	SSFUND	NS	NS	NS	NS	NS	.10**	NS	NS	NS	NS	.37***	NS		975	590	570	538	615	558	607
14.	EXTEVA	NS	NS	NS	NS	NS	NS	NS	NS	NS	.08*	.11***	.18***	NS		576	560	529	599	549	594
15.	WKEARN2	-.19***	NS	NS	.14***	.07	.24***	.41***	.24***	NS	NS	.20***	.08*	.09*	NS		600	552	669	585	656
16.	ASSAMT2	NS	NS	NS	.29***	.20***	-.13**	NS	-.12**	.71***	.53***	-.08*	NS	NS	NS	-.11**		540	617	569	607
17.	EV0406	NS	NS	NS	-.07	NS	NS	NS	NS	NS	NS	NS	.09*	NS	.62***	NS	NS		577	573	575
18.	CLØ1024	-.18***	NS	NS	NS	NS	NS	-.18***	NS	NS	NS	.29***	.19***	.14***	NS	.08*	NS	NS		611	693
19.	TRAINIG	-.33***	.15***	NS	-.16***	NS	.15***	-.16***	.09*	NS	NS	.46***	.19***	.17***	NS	.24***	NS	NS	.50***		604
20.	EMP2022	-.07	NS	NS	NS	NS	.07*	NS	NS	NS	NS	.12**	.07	NS	NS	.09*	NS	NS	.30***	.09*	

TABLE 9

Multiple Linear Regression Model Numerical Example 1 - What Combination of Intake Variables Would Provide An Optimum Prediction of Weekly Earnings at Closure?
WV FY69-70 10% Sample

Step	Predictor Variable	a	b	S. E. of b	|R|
1	WKEARN	32.648	0.550	0.055	0.40
2	WKEARN	57.353	0.579	0.054	0.45
	AGE		-0.657	0.118	
3	WKEARN	40.140	0.557	0.054	0.46
	AGE		-0.569	0.123	
	GRADE		1.572	0.649	
4	WKEARN	38.540	0.538	0.056	0.46
	AGE		-0.579	0.123	
	GRADE		1.642	0.650	
	NODEP		1.268	0.909	
9	WKEARN	48.443	0.466	0.063	0.47
	AGE		-0.648	0.134	
	GRADE		1.294	0.672	
	NODEP		2.725	1.112	
	NOFAM		-2.186	1.029	
	MOINC		1.717	0.810	
	MO0002		-0.248	0.413	
	ASTAMT		-0.036	0.064	
	ASTTIME		0.775	1.726	

N = 539

TABLE 10

Multiple Linear Regression Model Numerical Example 2 - What Combination of Intake Variables would Provide An Optimum Prediction of Public Assistance Monthly Amount At Closure? WV FY69-70 10% Sample

Step	Predictor Variable	a	b	S.E. of b	|R|
1	ASTAMT	1.829	0.581	0.027	0.69
2	ASTAMT	-0.480	0.557	0.028	0.70
	NODEP		1.930	0.574	
3	ASTAMT	8.895	0.552	0.027	0.71
	NODEP		1.825	0.572	
	GRADE		-1.007	0.392	
4	ASTAMT	2.328	0.556	0.027	0.71
	NODEP		1.711	0.575	
	GRADE		-0.822	0.406	
	AGE		0.132	0.078	
- -	- -	- -	- -	- -	- -
9	ASTAMT	-1.278	0.518	0.039	0.71
	NODEP		1.650	0.702	
	GRADE		-0.602	0.426	
	AGE		0.161	0.085	
	ASTTIME		1.241	1.067	
	WKEARN		-0.024	0.041	
	MOINC		-0.395	0.519	
	NOFAM		0.410	0.633	
	MO0002		0.099	0.261	

N = 511

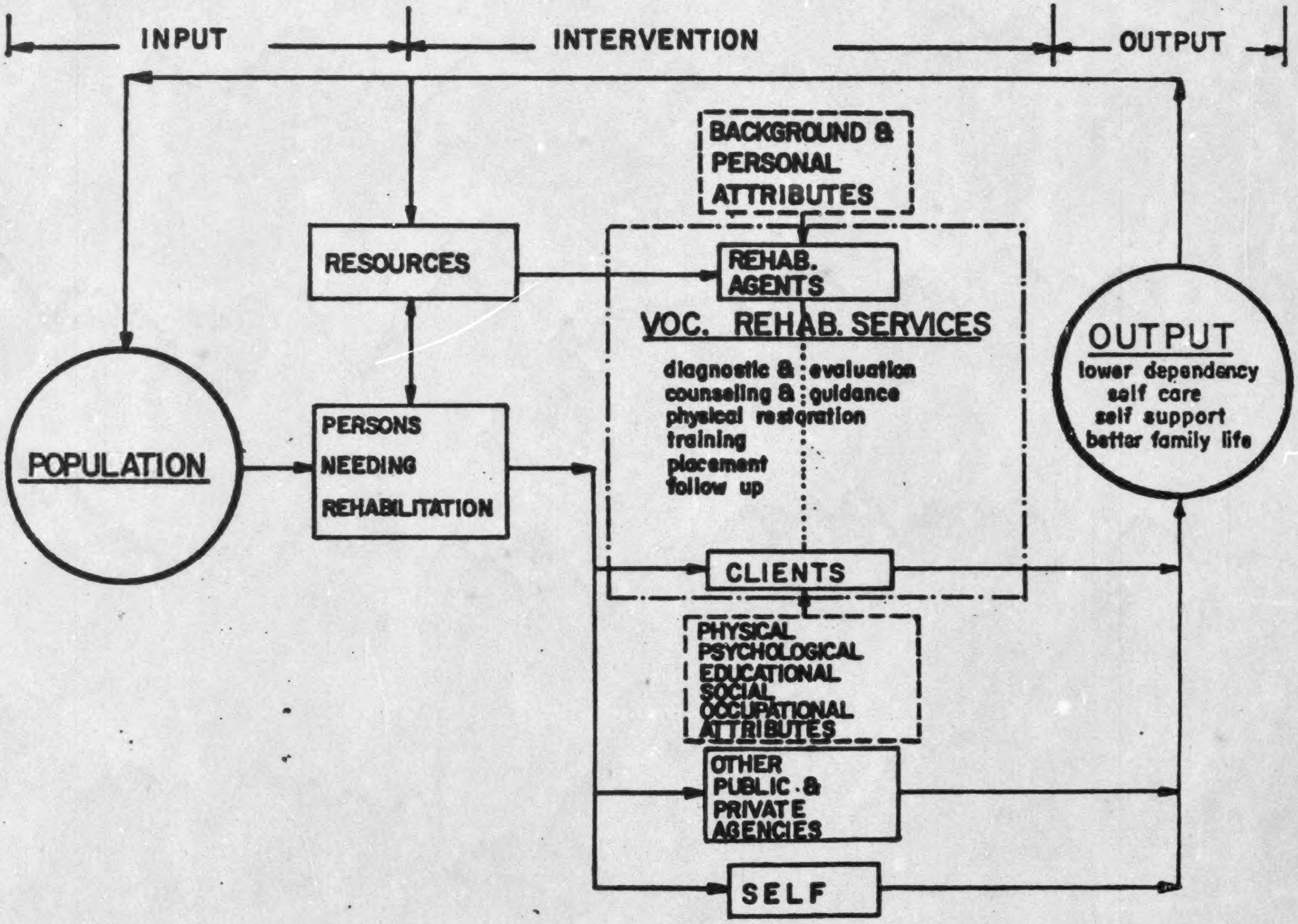
Figure Captions

Fig. 1. An input, intervention, output system.

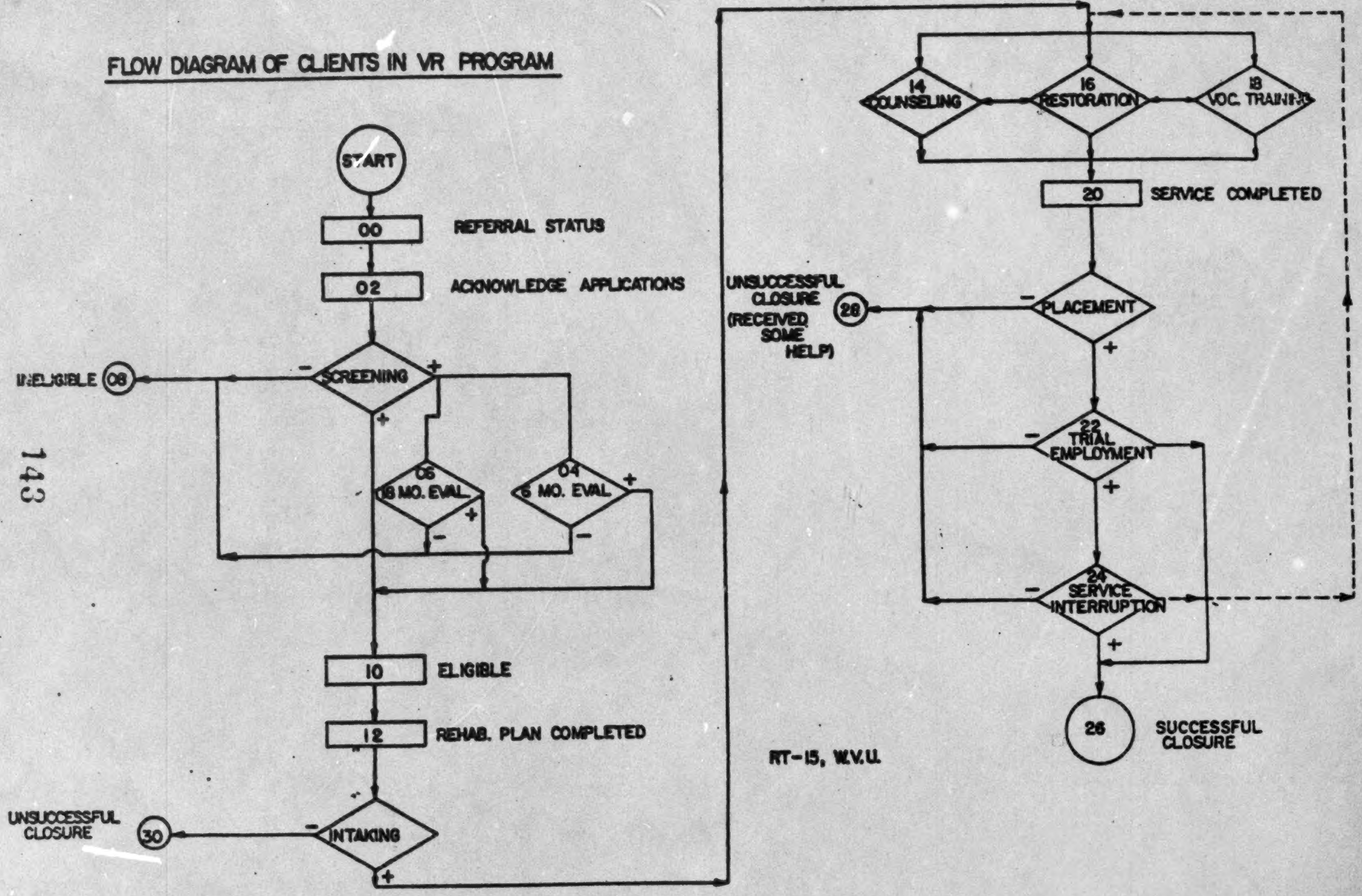
Fig. 2. Flow diagram of vocational rehabilitation.

Fig. 3. Form RSA-300.

VOCATIONAL REHABILITATION SYSTEM


INPUT
INTERVENTION
OUTPUT
POPULATION
RESOURCES
PERSONS
NEEDING
REHABILITATION
BACKGROUND &
PERSONAL
ATTRIBUTES
REHAB.
AGENTS
VOC. REHAB. SERVICES
diagnostic & evaluation
counseling & guidance
physical restoration
training
placement
follow up
CLIENTS
PHYSICAL
PSYCHOLOGICAL
EDUCATIONAL
SOCIAL
OCCUPATIONAL
ATTRIBUTES
OTHER
PUBLIC &
PRIVATE
AGENCIES
SELF
OUTPUT
lower dependency
self care
self support
better family life

FLOW DIAGRAM OF CLIENTS IN VR PROGRAM


START
00
REFERRAL STATUS
02
ACKNOWLEDGE APPLICATIONS
SCREENING
+
-
INELIGIBLE
08
06
18 MO. EVAL.
04
6 MO. EVAL.
10
ELIGIBLE
12
REHAB. PLAN COMPLETED
INTAKING
UNSUCCESSFUL CLOSURE
30
14
COUNSELING
16
RESTORATION
18
VOC. TRAINING
20
SERVICE COMPLETED
PLACEMENT
UNSUCCESSFUL CLOSURE (RECEIVED SOME HELP)
28
22
TRIAL EMPLOYMENT
24
SERVICE INTERRUPTION
26
SUCCESSFUL CLOSURE
RT-15, W.V.U.

Form RSA-300
Revised 7-69

Agency Code 48

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
National Center for Social Statistics
Washington, D.C. 20201

Form Approved
Budget Bureau
No. 83-R0040

Case Service Report: Federal-State Program of Vocational Rehabilitation

PART 1 (TO BE RECORDED AT TIME OF FIRST REFERRAL)

A. Last Name First Name Initial

B. Address: Street and Number

City	County	Code*	Zip Code

C. Referral Date ____________ D. Referral Source ______*

E. Age____ DOB__________ F. Sex: 1 ☐ Male; 2 ☐ Female

G. Disability as Reported (describe)

Code______*

PART 2 (TO BE RECORDED AT COMPLETION OF REFERRAL PROCESS)

A. Soc. Sec. Nr. ____________

B. SSDI Status at Referral—————______*

C. Race————————______*

D. Date Referral Process Completed

____

E. Months in Statuses 00-02————______

F. Spanish Surname—Yes ☐ 1; No ☐ 2

G. Outcome of Referral Process:

NOT ACCEPTED: Reason—————______*

1 ☐ from (00); 2 ☐ from (02)

Client Referred to——————______*

OR

Referral Not Appropriate——— ☐ 00

If closed from Status 00, complete items 3A through 3C. If closed from Status 02, complete items 2H through 2R and items 3A through 3C.

G. Outcome of Referral Process (cont'd.)

ACCEPTED FOR: 03 ☐—6-mo. Ext. Eval. (04)

04 ☐—18-mo. Ext. Eval. (06)

05 ☐——VR Services (10)

Complete items 2H through 2R. DO NOT COMPLETE ANY OF PART 3 AT THIS TIME.

H. Disabling Condition (describe):

1. Major

Code______*

2. Secondary

Code______*

I. Previous Closure within 36 Months:

No ☐ 1; Yes—Outcome: Rehab. ☐ 2

Not Rehab. ☐ 3

If Yes, Months Since Last Closure______

J. Marital Status————————______*

K. Number of Dependents—————______

L. Total Number in Family—————______

M. Highest Grade Completed————______

N. Work Status————————______*

O. Weekly Earnings—————— $ ______

P. Total Monthly Family Income (Including Earnings)——————______*

Q. Public Assistance { Type——————______*

Mo. Amt.—— $ ______

Time on PA——______*

R. Primary Source of Support————______*

PART 3 (TO BE RECORDED AT TIME OF CLOSURE)

A. Federal Special Program Identification*

None	TF	AFR	MMS	MAW	PO	WIN				SUM
										▨
000	001	002	004	010	020	040	100	200	400	

B. Cost of Case Services (Dollars)

1. All Services–Total	
2. Rehabilitation Facilities–Total	
3. Social Security Trust Funds–Total	
4. Extended Evaluation–Total	

C. Social Security Trust Fund Cases ONLY:

1. Social Security Claim Type————______*

If Claim Type Code 2, 3, or 4, enter Wage Earner's:

Last Name First Name Initial

Social Security Number

2. Check (x) if Administrative† Costs Only——☐

D. Date Ext. Eval. Completed (if applicable)____________

E. SSDI Status at Time of Closure——————______*

F. Work Status————————————______*

G. Weekly Earnings——————————$______

H. Public Assistance { Type——————————______*

Mo. Amt.————————$______

I. Occupation (title) ____________________

____________________ Code ______*

J. Number of Months on Agency Rolls:

1. In Extended Evaluation (Status 04 or 06)————______
2. From Acceptance to Closure (Statuses 10-24)————______
3. In Training (Status 18)————————______
4. Ready for or in Employment (Status 20 or 22)————______

K. Outcome of Extended Evaluation or VR Services

1 ☐ Closed from Ext. Eval. (Status 08): Reason————______*

2 ☐ Closed Rehabilitated (Status 26)

3 ☐ Closed Not Rehabilitated (Status 28): Reason————______*

4 ☐ Closed Not Rehabilitated (Status 30): Reason————______*

L. Services Provided: Indicate (x) if applicable

Type of Service Provided or Arranged for by Agency			With Cost Only (1)	Without Cost Only (2)	With & Without Cost (3)
10	Diagnostic and Evaluation				
11	Restoration (Phys. or Mental)				
12	TRAINING	College or University			
13		Other Academic (Elem./HS)			
14		Business School or College			
15		Vocational School			
16		On-the-Job			
17		Personal and Voc. Adjustment			
18		Miscellaneous			
19	Maintenance				
20	Other Services				
21	Services to Other Family Members				

M. State Agency Special Program Identification*

None	MPU	MHC	WYC							SUM
										▨
000	001	002	004	010	020	040	100	200	400	

*These items are to be coded. †Includes counseling, guidance, and placement.